SEPTEMBER 29, 1958

STEEL
The Metalworking Weekly

A PENTON PUBLICATION

Work Simplification

It's a topnotch way to boost productivity, says Allan H. Mogensen—P. 65

—director, Work Simplification Conferences

✔ **Forging Press Is Automated . . . Page 90**

✔ **Electrical Sheets Hit Slump . . . Page 115**

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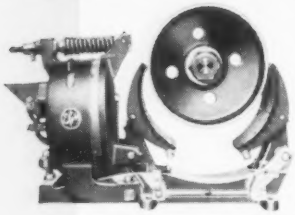
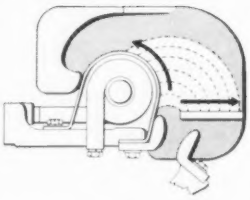
It's EC&M for a Complete Line of ELECTRIC CRANE CONTROL

BRAKES · DISCONNECT SWITCHES · CONTROLLERS · LIMIT STOPS

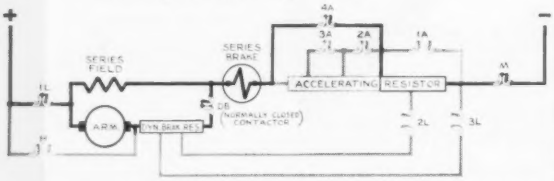


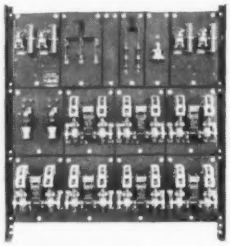
LONG-LIFE BRAKES for cranes operated by A.C. or D.C. power. High speed performance. Low upkeep.



CONTACTORS operate on the LINE-ARC principle. No destructive burning of arc shields. Cool contacts and reduced maintenance.

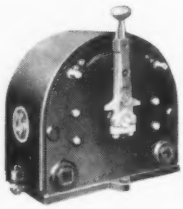
DYNAMIC LOWERING CIRCUITS for hoist motions. Respond quickly. Permit accurate inching for spotting loads.



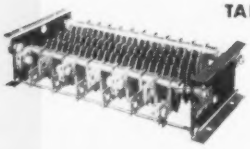


REVERSING-PLUGGING CONTROL for bridge and trolley motions. Automatically controlled acceleration. Only one simple relay for plugging.

YOUNGSTOWN SAFETY LIMIT STOPS protect against overhoisting accidents. Positive check against human errors.



CAM-TYPE MASTER SWITCHES have narrow width and short throw. Less operator fatigue.



TAB-WELD PLATE RESISTORS —spot-welding provides a continuous path, and keeps resistance value constant.

MANUAL-MAGNETIC DISCONNECT SWITCHES are very easy to operate. They are arranged to control crane lights, too.

THE ELECTRIC CONTROLLER & MFG. CO.

A DIVISION OF THE SQUARE D COMPANY

CLEVELAND 28 · OHIO

7405

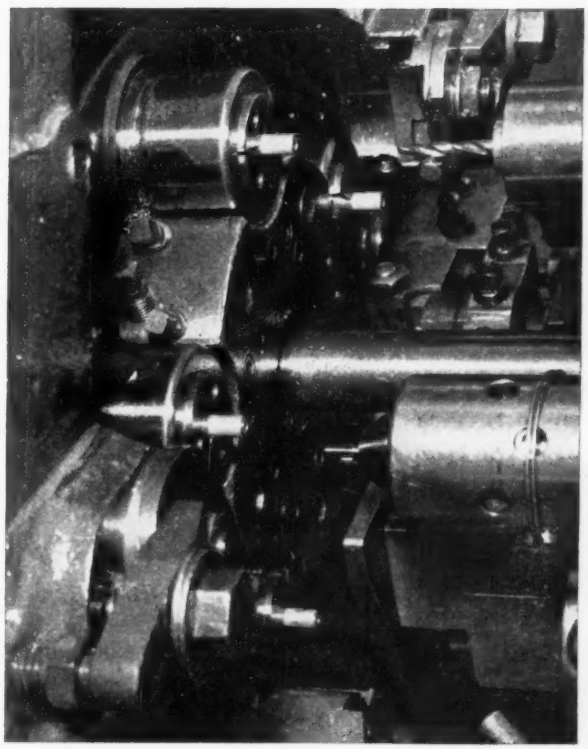
BETHLED

BETHLEHEM'S NEW LEADED SCREW STOCK

IMPROVED MACHINABILITY

measured in—

- *Faster Cutting Speeds*
- *Increased Tool Life*
- *Better Chip Control*
- *Smoother Machined Finishes*



These are all major advantages of swinging to Beth-Led, Bethlehem's new leaded screw stock—for faster production, greater profits.

Beth-Led is a high-sulfur carbon screw stock containing lead. And it's this lead content, added under rigid quality controls, which gives Beth-Led its many machining advantages. A change-over to Beth-Led will result in a superior quality product *machined at lower cost* on bar automatics.

Plan now to give Beth-Led a trial. Bethlehem leaded carbon screw stock is distributed through non-integrated cold-drawers . . . ask the one nearest you for full details. Or, contact our local sales office.

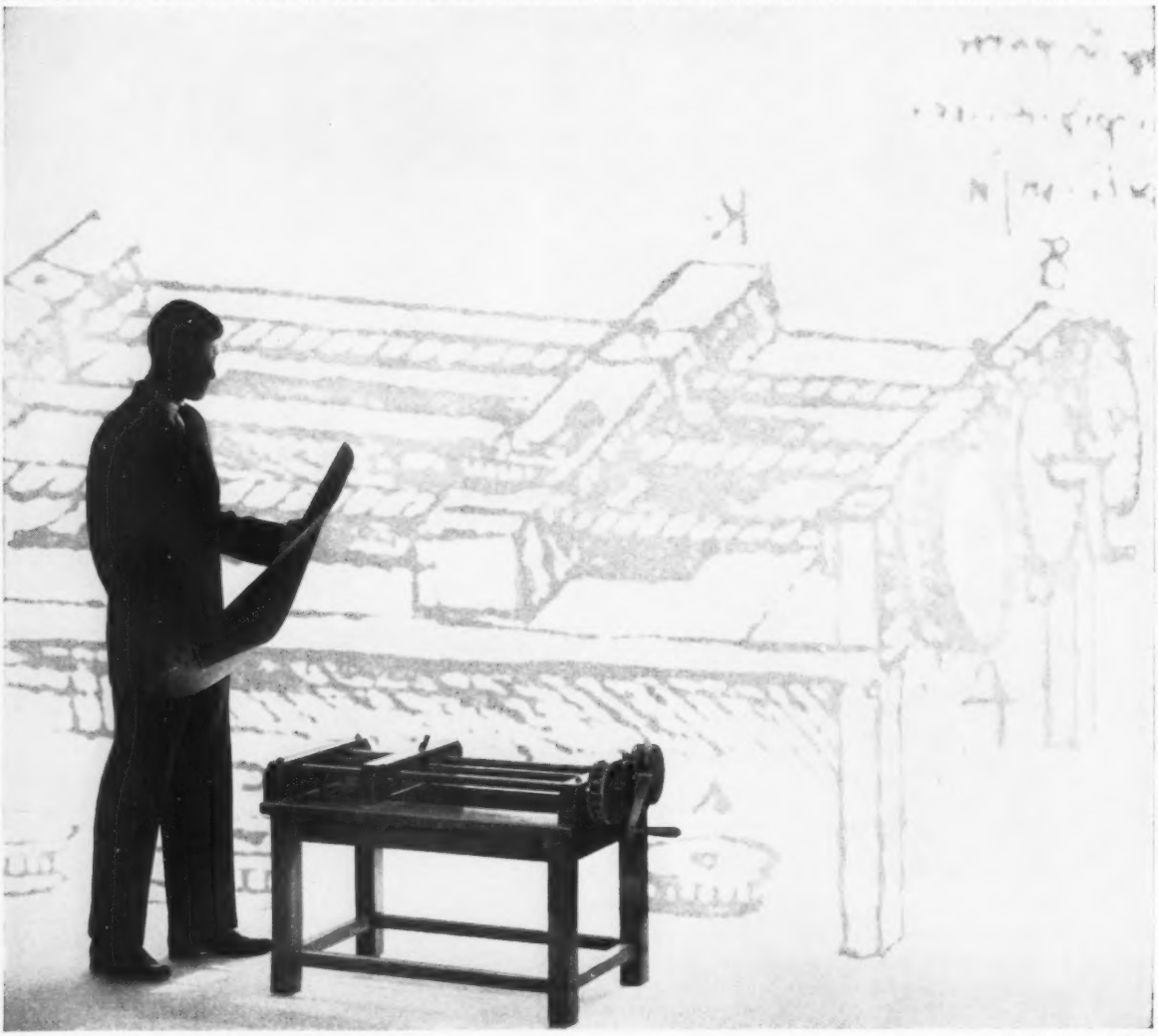
BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM STEEL

creative designing calls for an open mind



Leonardo Da Vinci's design for a screw cutting machine

Model courtesy of IBM

EVEN THIS DA VINCI DESIGN COULD HAVE BEEN BETTER WITH HELP FROM AN SKF ENGINEER.

The kind of bearings your SKF engineer recommends depends solely on your requirements, not on what he has to offer. That's because the SKF line includes all four basic types of ball and roller bearings in many thousands of sizes. This gives him the kind of flexibility he needs to keep an open mind on any bearing problem. Give your problem to SKF and see. 7832

Spherical, Cylindrical, Ball, and "Tyson" Tapered Roller Bearings

EVERY TYPE—EVERY USE

SKF

SKF INDUSTRIES, INC., PHILADELPHIA 32, PA.

*REG. U.S. PAT. OFF.

Whether you figure your parts production in thousands or millions, a Wean "Flying Press" can help cut costs

There is really no minimum production figure at which the ability of the Wean "Flying Press" to reduce cost/piece is diminished. For example, a "Flying Press" sold to a contract stamper is enabling this firm to get more short-run business, since a very competitive price can be quoted.

But where component parts are produced in large quantities, substantial economies are assured with the Wean "Flying Press." Due to the unique design of the "Flying Press," it processes coil at up to 300 fpm *continuously:* the strip never stops for indexing but flows through the "Flying Press" at a uniform rate. This elimination of "stop-and-go" operation, which has characterized and limited conventional stamping presses for years, has a further advantage than speed of production alone: it's easier on the dies. Actual comparative tests conducted by a "Flying Press" user showed that monthly die maintenance was reduced some 36% when standard dies were run on the "Flying Press."

The complete concept of the "Flying Press" takes a good bit of explanation: the practicality of it for your operations also requires the personal service of a Wean Sales Engineer. We suggest that, as a first step, you write us for an illustrated brochure on the "Flying Press": then we can arrange to have a Wean representative call at your convenience to explore the matter further. If you are actively interested in how this unusual piece of processing equipment can serve you, we can run your dies on a demonstration machine at our Cleveland plant.

WEAN

WEAN EQUIPMENT CORPORATION

CLEVELAND 17, OHIO

Detroit • Chicago • Newark

"...AND WEIRKOTE® CAN DO AWAY WITH PLATING OR DIPPING AFTER FABRICATION! IT WON'T PEEL OR FLAKE."

Q. A zinc-coated steel that won't peel or flake? That could save us a lot of money every month. Just what makes this Weirkote so special?

A. It's made by the continuous process, you know, which integrates zinc and steel so that the toughest fabrication won't break down the bond. You can work Weirkote to the very limits of the steel itself.

Q. Of course, that means the most complicated parts would have protection against rust. I like what I'm hearing. Is there more?

A. Yes . . . now Weirkote is treated to inhibit wet storage stain (white oxide). To make a long story short, I'd say this: With Weirkote, you can turn out a better product at lower cost. And you can free a lot of the capital, floor space and time you have tied up in plating operations.

Send for free booklet that details the time- and cost-saving advantages of skin-tight zinc-coated Weirkote. Weirton Steel Company, Dept. B7, Weirton, West Virginia.

WEIRTON STEEL COMPANY

WEIRTON, WEST VIRGINIA

a division of

NATIONAL STEEL CORPORATION

This Week in STEEL The Metalworking Weekly

September 29, 1958
Vol. 143 No. 13

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WORK SIMPLIFICATION

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STEEL, the metalworking weekly, is selectively distributed without charge to qualified management personnel with administrative, production, engineering, or purchasing functions in U. S. metalworking plants employing 20 or more. Those unable to qualify, or those wishing home delivered copies, may purchase copies at these rates: U. S. and possessions and Canada, $10 a year; all other countries, $20 a year; single copies, 50 cents. Metalworking Yearbook issue, $2. Published every Monday and copyright 1958 by The Penton Publishing Co., Penton Bldg., Cleveland 13, Ohio. Accepted as controlled circulation publication at Cleveland, Ohio.

Index available semiannually. STEEL is also indexed by Engineering Index, 29 W. 39th St., New York 18, N. Y.

Rx FOR TIRED MACHINES

PATIENT: Style 215 Precision Boring Machine—built in 1939.

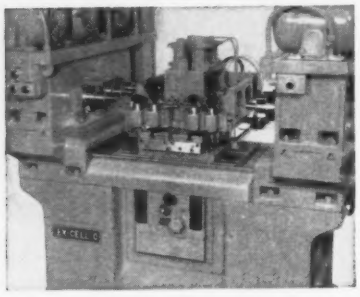
SYMPTOM: Speeds too slow for modern production, tooling outdated.

DIAGNOSIS: Continuous duty from 16 years of heavy work.

CURE: Ex-Cell-O Machine Renewal and Repair Service.

RECOVERY: Fast, complete, guaranteed.

FUTURE: Longer life, "like new" performance.



This 16-year-old Precision Boring Machine, recently rebuilt and retooled by Ex-Cell-O, is back on the job, giving profitable, "like new" service. Renewal or modernization of standard or special machines by Ex-Cell-O experts restores original precision and greatly extends the value of your investment. The service is quick, the workmanship thorough, and your complete satisfaction is guaranteed. Call your local Ex-Cell-O Representative, or write direct for full details.

XLO EX-CELL-O FOR PRECISION
58-52

EX-CELL-O CORPORATION
DETROIT 32, MICHIGAN

behind the scenes

Faster, Better, Cheaper

Allan H. Mogensen, director of work simplification conferences, exudes confidence as he beams from the cover of this week's STEEL. Mr. Mogensen has good reason to exhibit assurance: He teaches manufacturers how to simplify production, and they express their appreciation in the form of checks in his favor, and everybody comes out ahead.

Mogensen conducts his work simplification seminars at Lake Placid, N. Y., and Sea Island, Ga. Closely removed from the ski slopes, rinks, and beaches, Mogensen and his customers take down their hair and ask one another why any job can't be done faster, better, and cheaper. Before we pursue this subject with mounting attention, let us attend for a moment the word "cheaper." Some people shun this word, although it really means what they wish to say. When it should be the obvious choice, they do some frantic shadowboxing with their vocabularies, and come up with enervated terms like less expensive, costs less, and so forth. They are afraid to come right out and say that something is cheap, when that is what they mean.

Ol' Shrdlu stands foursquare on the reclamation and bold use of the word cheap. Most of us are cheap enough to pay attention to any notice informing us that we can save money; indeed, if industry didn't watch its pennies, few of us would have jobs. STEEL's article on work simplification (Page 65) tells how Mogensen methods get things done cheaper; it shows how productivity can be boosted, how employees can be utilized instead of exploited, and a lot of interesting stuff like that. The moral, perhaps, is that you don't necessarily cheapen your product if you make it cheaper; more often than not, you will make more products and more money, and who wants to quarrel with that?

Guts Again

The fact that people agree that people are funny is a clear indication that people have enough wry humor to recognize their peculiar attitudes and affectations. For instance, we don't recognize Red China, although it represents an organization of a couple of hundred million persons, and a big chunk of Asia; inlaws often pretend that former inlaws don't exist, and publications seldom mention their competition. We don't have any former inlaws, and we can't do anything about China, but we can compliment McGraw-Hill on some publicity it sent out concerning the advantages of advertising in business publications. It was a little booklet called "The Murchison Parable."

You see, M. E. Dupre, advertising manager of the Van Norman Industries, owners of the Morse Twist Drill & Machine Co., New Bedford, Mass., thought earnestly about the premise that the best time to advertise is when competition cuts its advertising budget in the mistaken belief that it is saving money. He consulted with Charles F. Myers, president of Morse, and Mr. Myers went on record—in the *New Bedford Sunday Standard-Times*, to be precise. "The industrial advertising budget," he declared, "has often been exploited. When profits are up, it's deductible; when profits are down, it's dead. Our advertising schedule is an integral part of our sales program, and this is no time to relax our selling efforts." His next words were picked up and published in the industrial press throughout the country, in the form of a double page ad: "Guts, not cuts, are what business needs right now."

This is a follow-up of an item that appeared here a short time ago (STEEL, Sept. 8, p. 6). We thought you might be interested in the story about the "Guts" ad.

News vs. Advertising

Ivory towers, sharpened quills, virgin foolscap, and editorial sanctums have their appeals, no doubt, but editorial work may be considered conservative by some of the advertising fraternity.

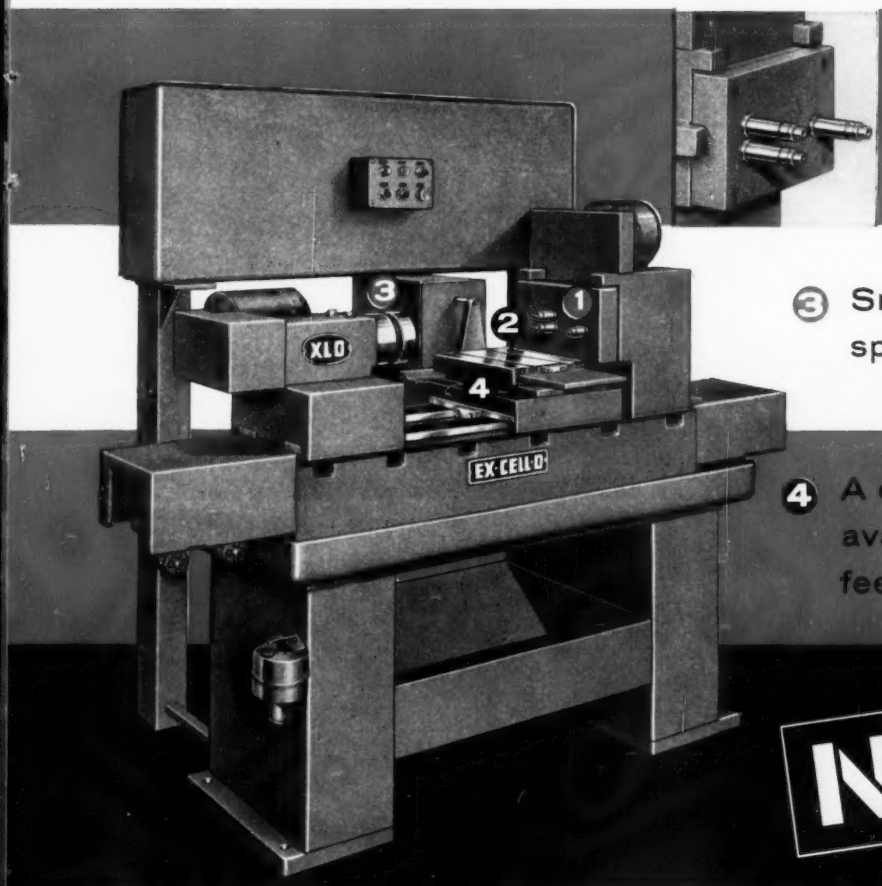
We thought we saw their point last week in a three-page ad in STEEL; it was produced for Eli Lilly & Co., Indianapolis, manufacturers of pharmaceuticals, agricultural, and industrial products. The ad described the virtues of Elcide 75, a material that has proved itself a bacteria killer in medical science and is now being used in the metalworking world to kill the stink in old cutting fluids. (The word they used was odor.)

The advertiser—ah, he showed a man's face occupying almost the whole page. It looked like one of those ads for Polaroid Land Cameras, where the portrait shows every whisker, every pore, every razor nick. Best of all, the gentleman looked like an old Broadway playboy disguised as a machinist, and he was smelling a life size daisy! The idea was that he and his buddies were tired of smelling stinking cutting fluid, but from now on, thanks to the use of Elcide 75, coolants in the daisy-smellin' man's plant were going to smell as fresh as a daisy.

Shrdlu

(Metalworking Outlook—Page 49)

1 New Micro Spindles are as small as 3/4″ dia.
...Precision Bore holes as small as 1/16″



2 Bores multiple holes at close center distances

3 Small conventional spindles can be used

4 A cross slide is available for grooving, feed facing, or indexing

NEW!

58-41

For Precision Boring of Small Components

New Ex-Cell-O Machines designed for production boring, turning, grooving, recessing, facing, counterboring and chamfering of instruments, missile parts, other precision applications.

These two new Ex-Cell-O machines put *precision* boring of aircraft, missile and automotive parts, instruments and other exacting components on a low-unit-cost production basis.

Precision-built midget spindles permit close center-distance boring and facing. Multiple holes as small as 1/16-inch can be bored with remarkable accuracy; and for maximum versatility, small conventional Ex-Cell-O Precision Spindles can also be used when required.

Compact Style 711 (single-end) and Style 712 (double-end) Precision Boring Machines have hardened and ground ways, pushbutton control, pneumatic-hydraulic table and feed control.

Optional equipment includes a mist coolant system and cross slide attachment for grooving, feed facing or indexing.

See your local Ex-Cell-O Representative or write direct.

EX-CELL-O FOR PRECISION

EX-CELL-O CORPORATION
DETROIT 32, MICHIGAN

XLO

Machinery Division

MANUFACTURERS OF PRECISION MACHINE TOOLS • GRINDING AND BORING SPINDLES CUTTING TOOLS • TORQUE ACTUATORS • RAILROAD PINS AND BUSHINGS • DRILL JIG BUSHINGS • AIRCRAFT AND MISCELLANEOUS PRODUCTION PARTS • DAIRY EQUIPMENT

IT ALL ADDS UP...

to 12,347 Federal Ball Bearing sizes!

That's our latest count (there are hundreds of types, too) and the figure is constantly climbing. *It has to* in order to keep pace with the demands of industry. That's why so many famous companies like to do business with Federal—General Electric, Thompson Products, Lees-Bradner, IBM, Allis Chalmers—these are just a few.

How about you? Since Federal Ball Bearings are part of so many things you *use*, shouldn't they be part of the things you *make?*

THE FEDERAL BEARINGS CO., INC. • POUGHKEEPSIE, NEW YORK

Federal Ball Bearings *One of America's Largest Ball Bearing Manufacturers*

Accent on excellence

Youngstown enameling sheets

For years, Youngstown Metal Products Company has produced millions of drawn stampings and fabricated parts for the nation's leading metal products manufacturers—such as this bath tub component. Their corporate philosophy has been—"to provide a product of highest quality and unwavering uniformity".

To secure continuous high-production runs and consistent product quality, Youngstown Metal Products turns to Youngstown's Enameling Sheets as the basic raw material. They report, "Youngstown Sheets give us the proper blend of tensile strength, durability and surface finish that helps us produce a super product for today's highly competitive market."

Wherever steel becomes a part of things *you* make, the high standards of Youngstown *quality*, the personal touch in Youngstown *service* will help you create products with an "accent on excellence".

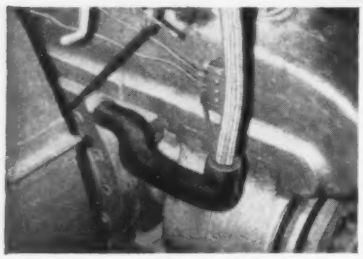
THE
YOUNGSTOWN
SHEET AND TUBE COMPANY

Manufacturers of Carbon, Alloy and Yoloy Steel, Youngstown, Ohio

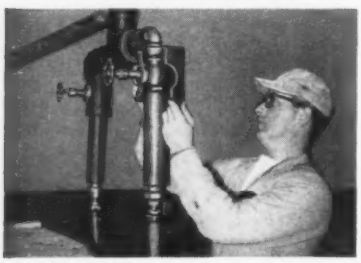
How to keep consistent temperatures and/or prevent condensation on warm or cold lines

Send for free Bulletin

Rubatex Tubing can be slipped onto piping before it's installed on air conditioning unit or system.



Flexible tubing can be easily installed onto piping with swings and bends up to 180°.



Slit tubing with adhesive applied fits snugly onto joint.

Complete data, applications and specifications on RUBATEX Closed Cellular Tubing Insulation—specially developed tubing for OEM, commercial, industrial and residential heating and cooling lines, chilled water and other cold lines where service conditions are moderate.

RUBATEX DIVISION, Dept. S-14
GREAT AMERICAN INDUSTRIES, INC.
Bedford, Virginia

PIONEER MANUFACTURER OF CLOSED CELLULAR RUBBER

Name_____

Type of Business_____

Proposed Application_____

Attach to your letterhead and mail this coupon for your copy of new Rubatex Tubing Bulletin today!

LETTERS
TO THE EDITORS

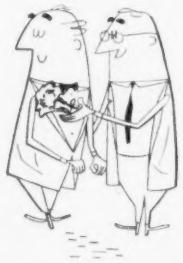
80 Management Reprints Wanted

We are interested in securing 80 copies of your 1958 Program for Management article, "Pricing for Profit" (June 16, Page 87).

We want them for distribution to our client bulletin list—a listing of executives in our clients' companies who are in the position of making policy decisions that affect advertising.

Irene Fitzgerald
Sidney Clayton & Associates
Chicago

Lauds Tax Depreciation Reform



I would like to compliment you on the fine tax presentation you made in your series of editorials on "Let's Take a Bold Look at Depreciation" and for the helpful and thought-provoking articles you have been running on the machine tool industry.

George Gorton III
President
George Gorton Machine Co.
Racine, Wis.

• • •

Let me compliment you upon the excellent and articulate editorials on depreciation reform which concern the three-way squeeze being imposed on equipment-using industry by present depreciation regulations, taxes on industry, and inflation.

The construction industry, as represented by the Associated General Contractors of America, Inc., is keenly aware of the precise problems you are discussing. A committee is most actively studying means of attacking the problem and of evaluating proposed bills.

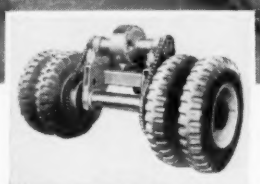
We share your feelings that 1958, for political and economic reasons, was not a year in which we could be too hopeful. Rather, we have devoted ourselves to preparation for next year and the years to come.

While it is our feeling that, as you suggest, the recession was closely associated with this problem, we still believe that confiscation of the American industrial plant will continue even should prosperity return, provided that inflation continues and tax laws are not revised.

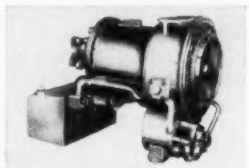
I am writing this letter as a word of appreciation and encouragement to you to continue your good work and to let you

(Please turn to Page 12)

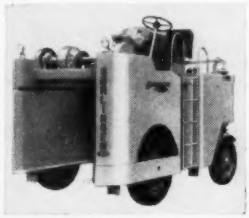
Today's industries need Gerlinger Continuous Operation



Gerlinger Stationary Load Axle carries all dead weight of load—protects differential housing against strain. An exclusive reduction gear prevents axle wear and tear.



Gerlinger Torqmatic Drive safeguards engine from damaging shocks, prevents stalling, eliminates gearshift guess and lessens driver fatigue. Extra operating ease is assured when Gerlinger Power Steering is added.



Gerlinger Material Carriers with capacities up to 60,000 pounds are more popular than ever *throughout industry* —handling steel, paper, chemicals, timber, lumber and other products for factories, mills and shipping docks.

Give Your BIG Jobs to Gerlinger!

This heavy-duty fork lift truck is loading 30,000 pounds as easily as you move a paperweight. The giant Gerlinger is a pneumatic-tired Model H-40 with the industry's greatest lifting capacity. It is built to handle 20 tons just as smoothly, with maximum savings in handling costs.

Gerlinger *Job-Proved* features make it possible for the operator to do a bigger day's work with less fatigue. Features like pivotal-mounted steering assembly, counter-active weight distribution, instant fingertip lift-tilt control and floating type mast action are some of the advances that put Gerlingers in a class by themselves.

If handling up to 40,000 pounds of products, parts or raw materials is practical in your production operation, don't fail to look at the performance records established by these Gerlinger fork lift trucks. Send for latest published data showing why you get unmatched savings—and require less downtime with far less maintenance cost — through *Gerlinger continuous operation.*

Leaders for 39 years in building Fork Lift Trucks and Carriers

TOWMOTOR THE ONE-MAN-GANG **-GERLINGER***

**Gerlinger Carrier Co., Dallas, Oregon is a subsidiary of Towmotor Corporation, Cleveland, Ohio*

☐ Send free Gerlinger Fork Lift Truck literature with specs

☐ Send free Certified Job Studies relating to our business which is:

Name_____

Company_____

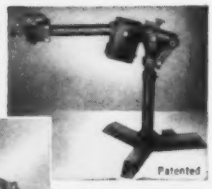
Address_____

Mail to **GERLINGER CARRIER CO.**, Dallas, Oregon

ARONSON
Offers You Over 200 PROVEN Standard Stock Models of Quality POSITIONERS "POSITIONEERED" to your exact Requirements

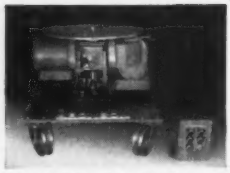
Aronson TracTred (T. M. Reg.) Turning Rolls for thin-walled heavy cylindrical work to 27 tons capacity. Zero to 100 IPM turning speed and Built-In Grounding.

Aronson Universal Balance Positioners (T. M. Reg.) position your weldments effectively, instantly for downhand welding. Capacities to 2000 lbs.

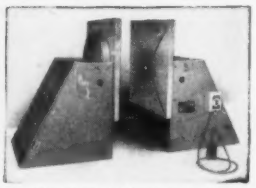


Heavy Duty Precision Built Rubber and Steel Tired Turning and Pipe Rolls, 100% overload protected Capacities to 600 Tons.

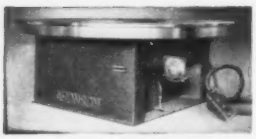
Fully Automatic Gear Driven Positioners, featuring Geared Elevation, 135° Tilting and Variable or Constant Speed Rotation. Capacities to 350,000 lbs.



Model D Gear Driven Positioners. Compact, Precise, Rugged Capacities to 1000 lbs.



Rugged Head and Tail Stock for positioning bulky weldments between centers. Table Backup for Zero Deflection. Magnetic Braking. Capacities to 160,000 lbs. Geared Elevation Optional.



Heavy Duty Floor Turntables with precision speed control and Magnetic Braking, used for welding, burning, X-raying, etc. Capacities to 120,000 lbs., various heights and speeds.

Bench Turntable Automatic Positioners with Mercury Grounding. Capacities to 500 lbs.

Quality POSITIONERS by **Aronson MACHINE COMPANY**
ARCADE, NEW YORK

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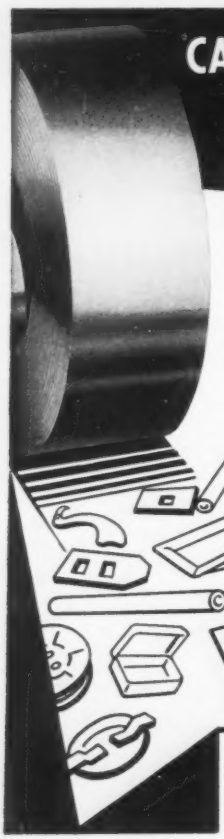

FOR ITS OWN FABRICATING NEEDS AND FOR YOURS

Whether you are merely after information on the fabrication of pre-painted and electro-galvanized steel, or are looking for a reliable source for these products—Canfield offers every advantage. Canfield is one of three divisions within Life Time Products Corporation, and produces pre-coated steels for further fabrication within the corporation. This experience in the use of their own steels guides every consultation with prospective users. Too, Canfield assures you the same uniform properties and quality it is required to furnish within its own corporate establishment. Capacity to .060x48" wide. Why not consult with a Canfield representative? No obligation, of course.

ANOTHER CANFIELD SERVICE: SLITTING, ELECTRO-GALVANIZING AND ENAMELING CUSTOMERS' STEEL

CANFIELD STEEL COMPANY
DIVISION OF LIFETIME PRODUCTS CORP.
CANFIELD, OHIO

LETTERS

(Concluded from Page 10)

know that we have joined you; that you are not alone; and that we feel this is, perhaps, the most pressing problem facing all American industry today.

It is our prayer that the time is not too far away for the selection of the most desirable and practical tax reforms and that a joining of hands by all American industry will effect these reforms before we reach the point where government will find it necessary to furnish capital equipment with all the numerous intolerable consequences incident thereto.

Robert M. Hoover
Chairman
Reinvestment Depreciation Committee
Associated General Contractors of America, Inc.
c/o 928 Broadway
Kansas City 5, Mo.

Product Price Cut 20%

In your Sept. 8 issue (page 98), you had an interesting article on drilling dies, "We Cut Product Price 20% With More Efficient Machine." I would like 12 copies.

Joe W. Wenger
Wenger Mixer Mfg. Co.
Sabetha, Kans.

Your Best Bet Is STEEL

Do you have a later financial analysis of steel producers than the 1956 report? If so, we would appreciate the information.

Thanks much. I still say: "When you want information on steel, STEEL is your best bet!"

Marion G. Reisner
Purchasing Agent
Adams Co.
Dubuque, Iowa

• *We are forwarding a copy of our 33rd annual financial analysis of the steel industry, "Steel Sales and Profits Set Records" (Mar. 31 insert).*

Interesting, Timely Articles

Your Program for Management articles are extremely interesting and timely. Inasmuch as articles are not usually cut out of company-circulated magazines, such as STEEL, I would appreciate a personal set of the articles to date. I especially want the one on "Surveying the Market" (Aug. 18, Page 85).

Charles Folkman
Manager of Manufacturing Engineering
Industrial & Marine Div.
Walter Kidde & Co. Inc.
Belleville, N. J.

Reader Requests Two Articles

I would appreciate receiving two copies each of the articles, "Pickle Liquor Disposal Made Practical" (July 28, Page 76), and "18 Often Ignored Ways To Cut Costs" (July 21, Page 74).

J. H. Fishburn
Superintendent
Continuousweld Dept.
Welland Works
Page-Hershey Tubes Ltd.
Welland, Ont.

"The Board balked at first...

but I convinced them that now was a good time to buy!"

When machine tool builders work with smaller backlogs they're naturally more efficient and can make better deliveries... are more able to control costs ...more able to render the many *extra* custom engineering services that disrupt regular production during peak schedules. As a matter of fact, many progressive buyers are at their busiest now... taking advantage of the sound buying position the economy gives them as it pauses for its breath... seizing the opportunity to get ready for tomorrow today.

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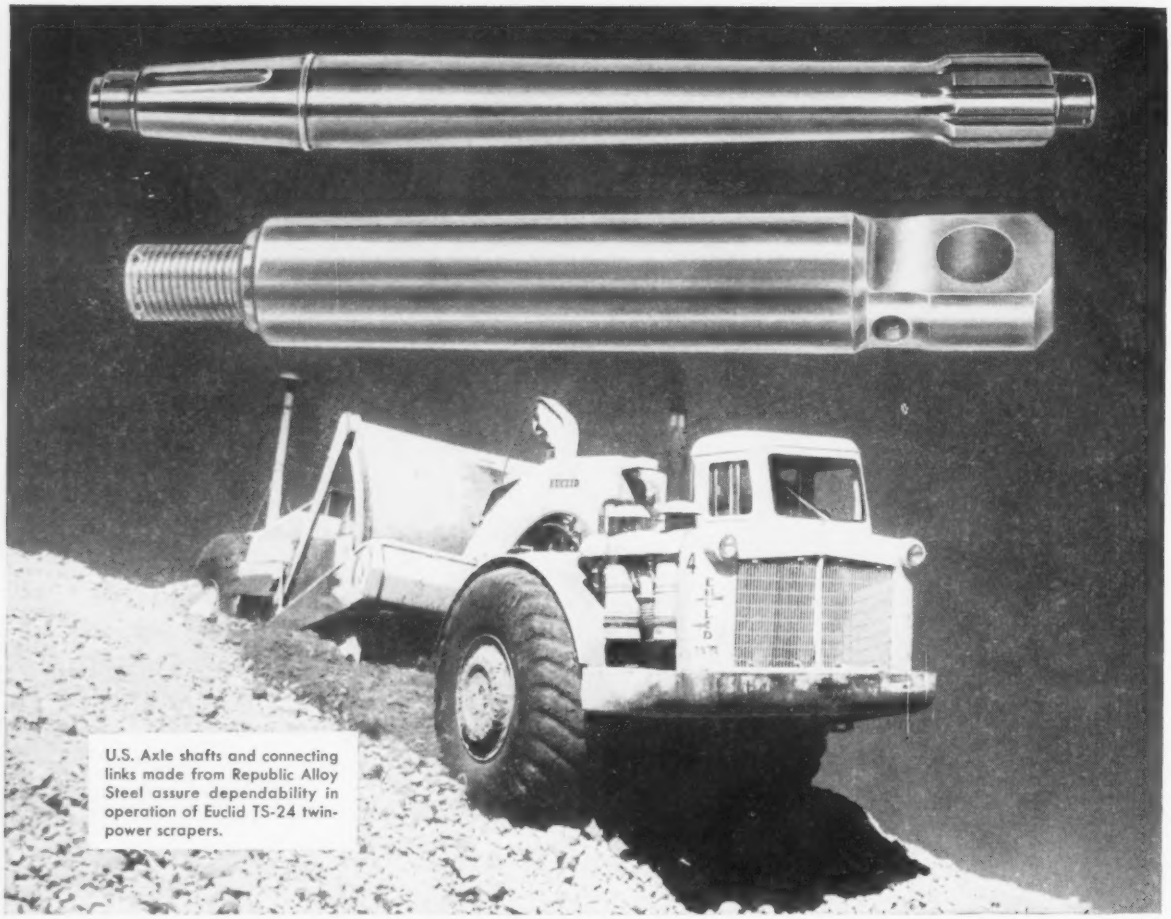
MEET REQUIREMENTS FOR DEPENDABILITY, STRENGTH, ECONOMY, CLOSE TOLERANCE



U.S. Axle shafts and connecting links made from Republic Alloy Steel assure dependability in operation of Euclid TS-24 twin-power scrapers.

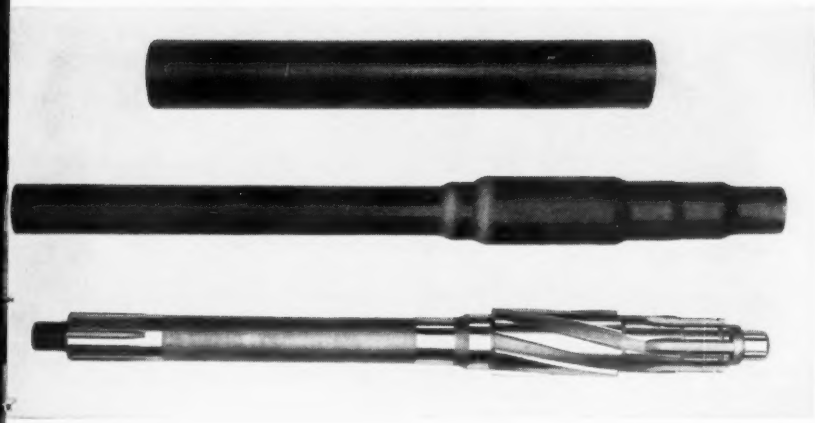
REPUBLIC ALLOY STEELS ADD DEPENDABILITY, TOUGHNESS, STRENGTH, QUALITY TO A PRESTIGE PRODUCT. Axle shafts and connecting links produced by The U.S. Axle Company, Inc., Pottstown, Pennsylvania, are known throughout the world for their extra stamina to withstand emergencies as well as everyday use.

To maintain their reputation for quality and dependability, U.S. Axle specifies only the finest materials, including Republic 4300 series hot rolled Alloy Steels.

These finest of steels provide the high strength, toughness, shock-resistance, and abrasion-resistance values needed to withstand the severe service to which the shafts and links are subjected. Alloy Steel's uniform response to heat treatment gives these parts hard surfaces around tough cores, providing maximum resistance to abrasion, friction, and wear.

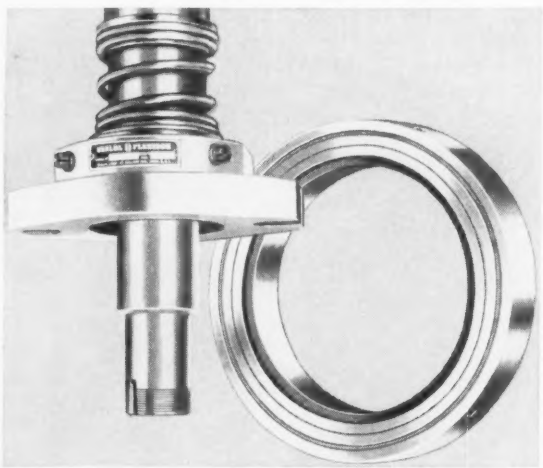
In Republic Alloy Steels you will find the highest strength values—plus an exceptionally high strength-to-weight ratio that permits the design of thinner sections to save weight and hold down size without any sacrifice of needed strength.

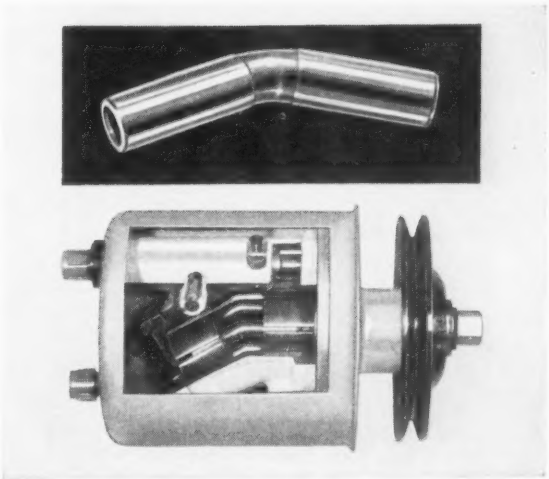
Specify Republic Alloy Steels to insure safety, to extend equipment life, to cut maintenance and replacement costs. Specify Republic Alloy Steels where strength and toughness must resist heavy-duty roughness. We offer you the services of our experienced field metallurgists to help you get the most from these versatile steels at the lowest possible cost. The coupon is your invitation to their services.



REPUBLIC DIE-FORM MEANS ECONOMY. This new fabricating process can save you 1 out of 3 tons of steel. The automotive transmission shaft, shown at left, proves the point. Using Die-Form, 200 tons of cold finished blanks produced parts formerly requiring 300 tons. Die-Form is a new method of cold forming hot rolled carbon, alloy, or stainless steel bars into multi-diameter blanks ready for final machining. It permits major savings in time, material, and money in mass produced, multi-diameter machine shafts. Since Die-Form closely approximates the final part, only finishing cuts and/or grinding are required for completion. Scrap loss is minimized—production rate increased. Send coupon for booklet describing the advantages of this new process.

REPUBLIC ENDURO® STAINLESS STEEL BARS provide a machine finish that looks as good as a ground finish. That's the performance report from machine operators at Sealol Corporation, Providence, Rhode Island. The company uses Free-Machining ENDURO bars in manufacturing mechanical shaft seals for application on fuel tankers, and in the aircraft, petroleum, food and chemical industries. The Sealol machine operators also report that they like the machinability of ENDURO bars—the fine surface finish, the accuracy of section, the uniform soundness, the ability of ENDURO to hold close tolerances. Send coupon for complete facts on Free-Machining ENDURO Stainless Steel Bars.





REPUBLIC ELECTRUNITE® MECHANICAL TUBING meets all close tolerance requirements for new automotive pump (above). The unusual ductility, uniformity, and workability of ELECTRUNITE Mechanical Tubing also meets the performance requirements of this hydraulic power pump designed and assembled by Thompson Products, Inc., Cleveland, Ohio. Will-O-Hill Industries, Inc., Willoughby, Ohio, subcontractor and specialist in close tolerance tubular stampings, cut 7/16-inch diameter ELECTRUNITE into units 2 3/16 inches long. Each unit is rolled to form a slight groove in the center, and bent to an angle of exactly 150°. Both ends are subsequently bent in a die, held to a tolerance of ± .0005 inches and finished to an O.D. to ± .0003 inches. Republic Engineers will work with you in solving precision problems and reducing costs with ELECTRUNITE Mechanical Tubing. Send coupon today.

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World's Widest Range of Standard Steels and Steel Products

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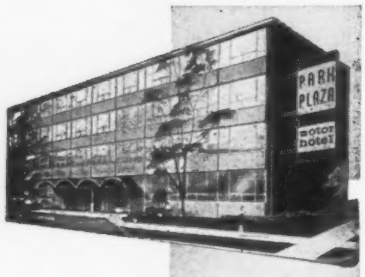

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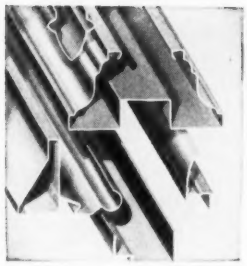
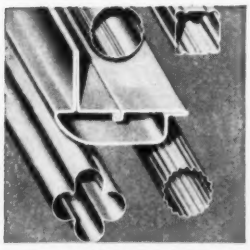


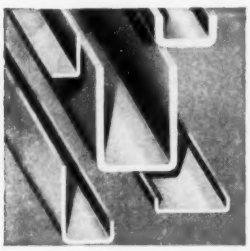
SPECIAL SHAPES

WELDED TUBING



LOCK SEAM TUBING

TIGHT & OPEN SEAM



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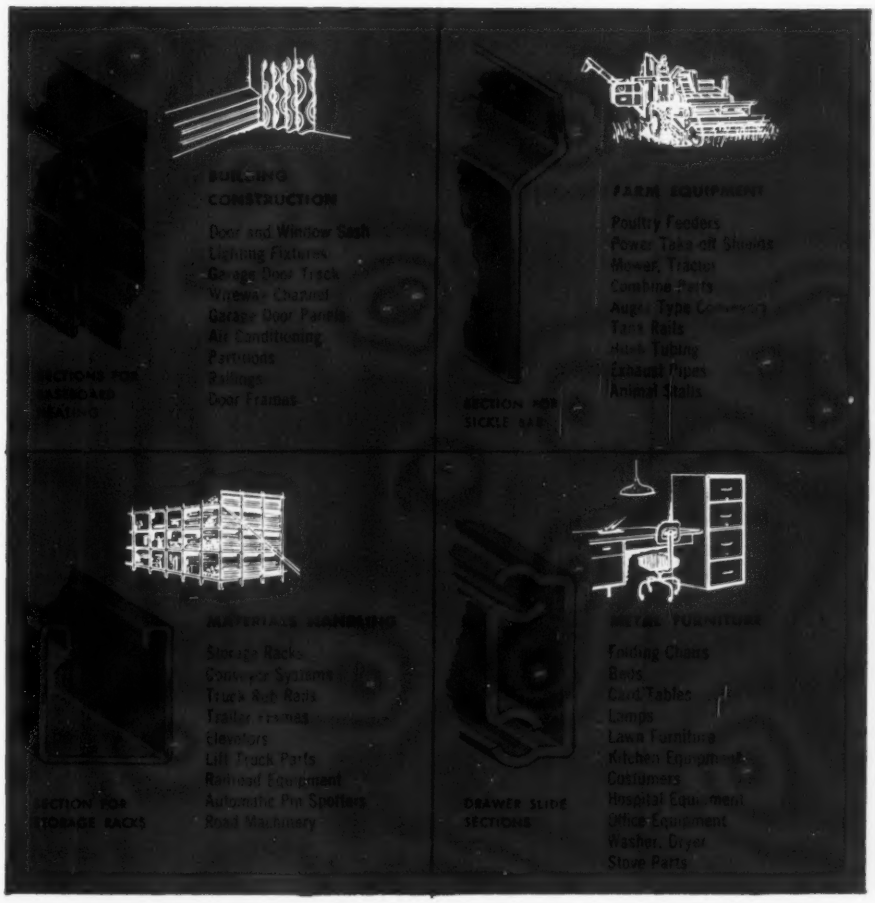
WRITE FOR THESE FREE HANDBOOKS

32 page Welded Tubing Handbook, contains sizes, gauges, tolerances and other engineering data in handy reference form.

48 page handbook explains basic principles of Roller Die, Cold Formed shapes and shows dozens of ideas that have taken shape.



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NEW HYDRAULIC SLOTTER OFFERS BOTH

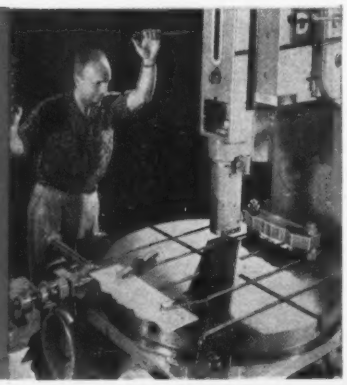
tracing and conventional slotting

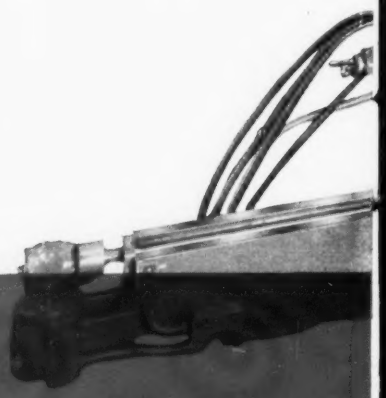
Here's a powerful new Hy-Draulic Slotter capable of doing both conventional slotting and complicated tracing work. Rotary tracing and straight work are handled by a transverse movement of the saddle. Equipped with a highly sensitive, precision-engineered Kopy-Kat Duplicator, this slotter will actually produce its own working templates from a toolroom master, or from a finished workpiece.

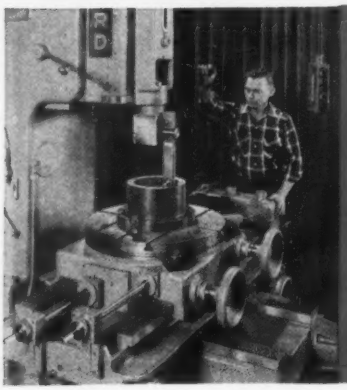
Design features of this versatile new machine include powerful fulcrum drive to the ram, hydraulic feeds and power rapid traverse in all directions, and pendant controlled cutting speed changes.

See your Rockford Machine Tool Co. representative, or write us directly, for the complete information on this new Hy-Draulic Slotter.

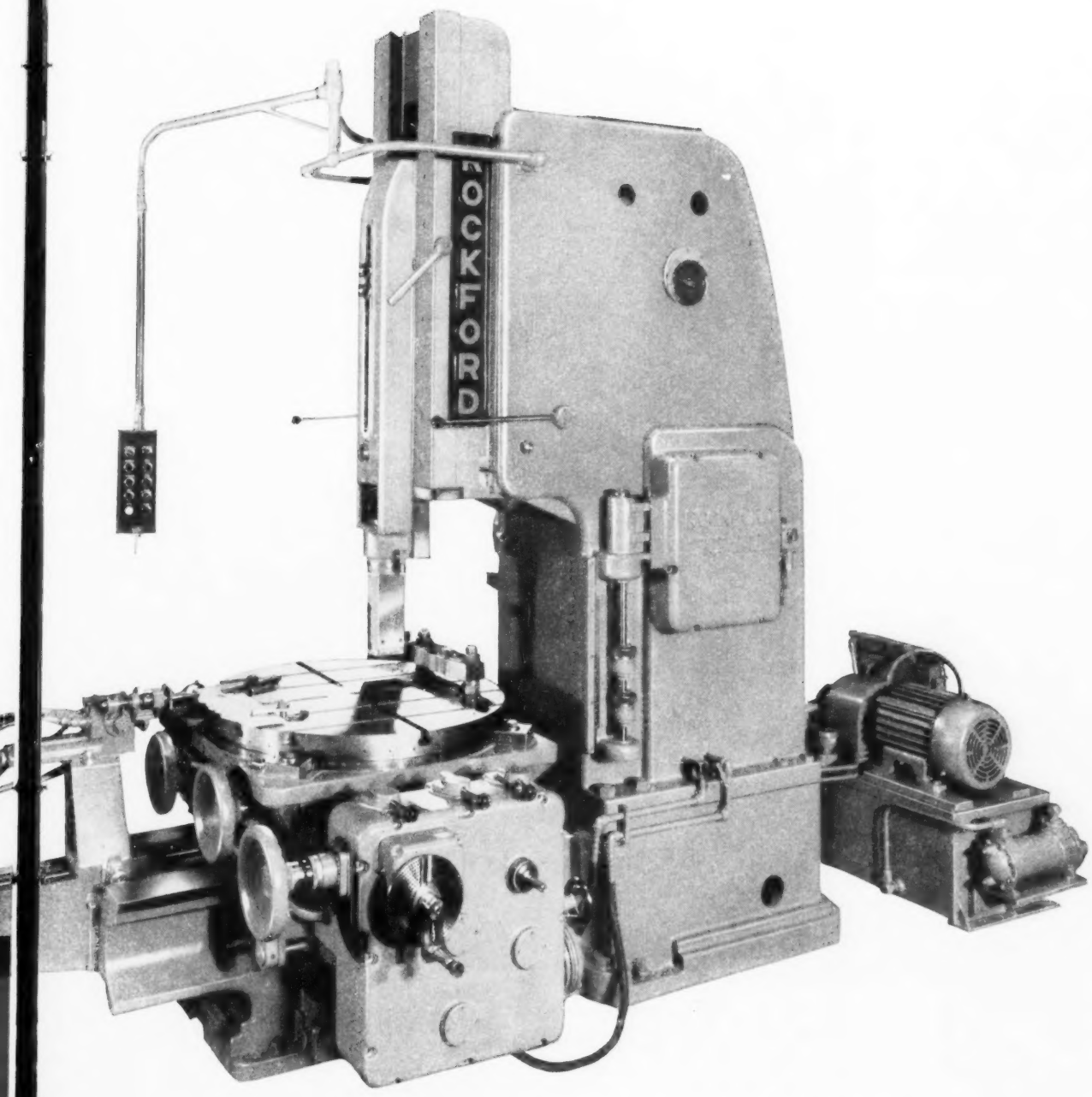
tracing







conventional slotting



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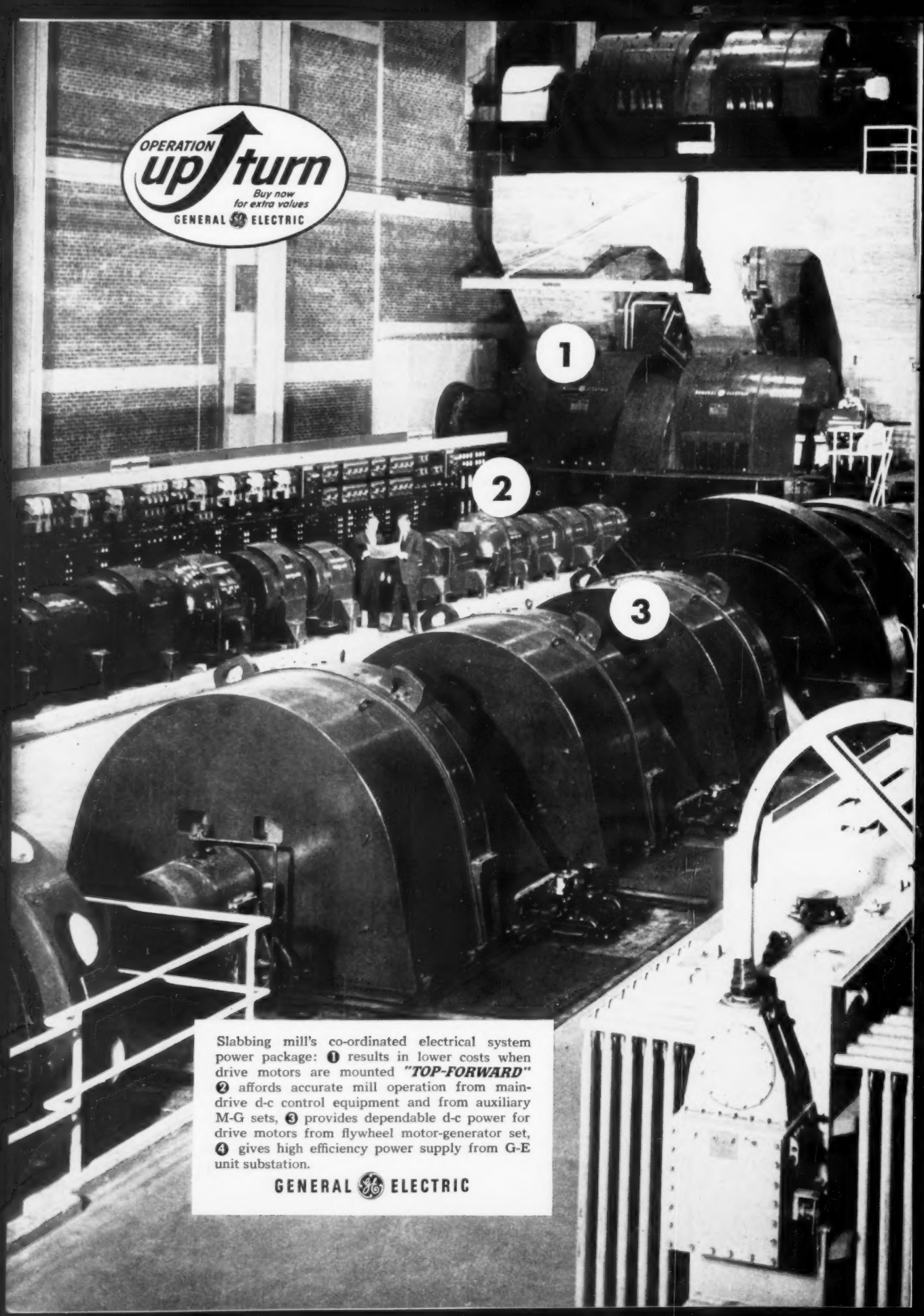
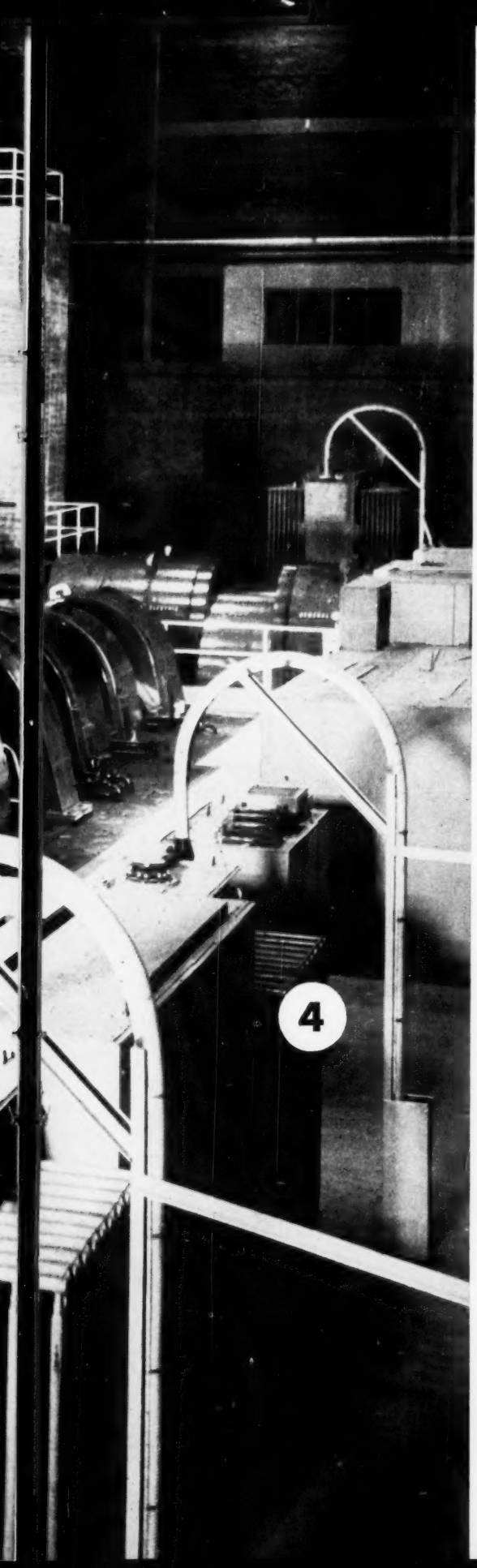


Slabbing mill's co-ordinated electrical system power package: ❶ results in lower costs when drive motors are mounted ***"TOP-FORWARD"*** ❷ affords accurate mill operation from main-drive d-c control equipment and from auxiliary M-G sets, ❸ provides dependable d-c power for drive motors from flywheel motor-generator set, ❹ gives high efficiency power supply from G-E unit substation.

GENERAL ELECTRIC



New General Electric Drive System . . .

Lowers Installation, Maintenance Costs

A new General Electric DC Drive System for reversing mills incorporates unique features designed to save considerable installation and yearly maintenance expense. With the G-E design, large twin drive motors become easily accessible—this means less maintenance expense. And, with ventilating equipment "built-in", foundation and other installation costs are reduced. Modernization of obsolete mills becomes more economical than ever before.

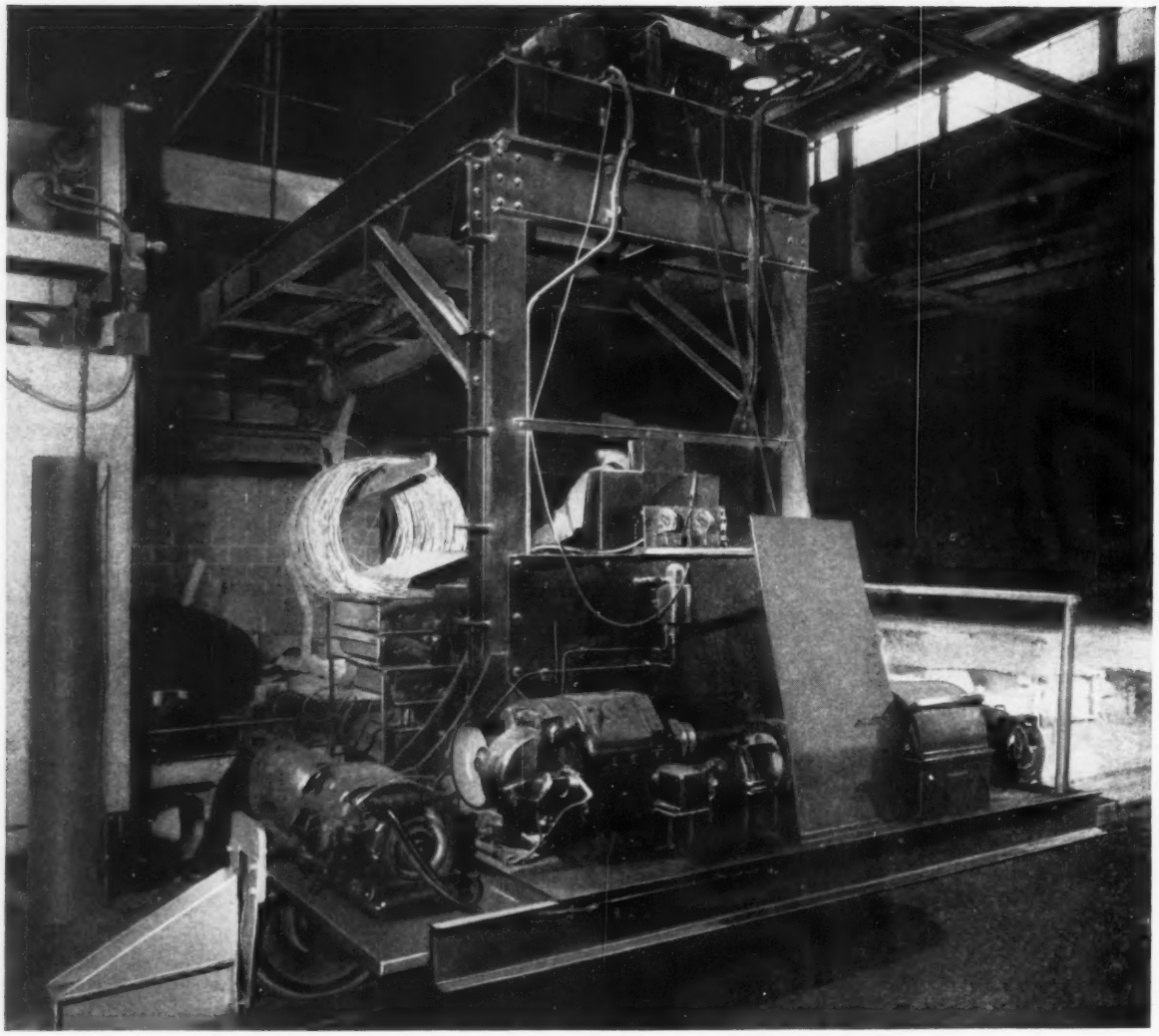
Now in operation at an Eastern mill, the new drive system resulted from an extensive G-E engineering study into previous construction and maintenance procedures. The new ***"TOP-FORWARD"*** arrangement, for example, places the top motor nearest the mill, with the rear motor shaft passing under the forward motor. Result: servicing time is reduced. Design of quick-removable motor covers permits faster servicing, with a minimum of effort.

These revolutionary ***"TOP-FORWARD"*** mill motors with extra value features available now, combine with other electrical system components to give one of the fastest and most accurate drive systems now available to the metal rolling industry.

G.E. is ready to work with you to provide the most advanced quality-engineered electrical equipment for your mill applications. Your nearest General Electric Apparatus Sales Office will give you complete information. Write for GEA-6812, DC Drives for Metal Rolling to General Electric Company, Schenectady 5, N. Y. 659-122

Engineered Electrical Systems for Steel Mills

GENERAL ELECTRIC



Boost production 50% with a crane?

This Whiting Gantry Crane did! Designed for a special need, it fits snug quarters, rides neatly under a low ceiling, has its hoisting drive mounted a step above floor level. Busy gantry gets full credit for increasing Continental Steel Company's rod and wire pickling and coating production by more than 50%. It's one of many types of Whiting Engineered Cranes available to meet the special needs of countless operations.

SEND FOR "METALWORKING PROFILES," the big, colorful new booklet of performance reports showing Whiting products on the job . . . bringing new efficiency and economy to the metalworking industries. Remember: what Whiting has done for others can be done for you! *Whiting Corporation, 15643 Lathrop Avenue, Harvey, Illinois.*

87 OF AMERICA'S "FIRST HUNDRED" CORPORATIONS ARE WHITING CUSTOMERS

WHITING CRANES

MANUFACTURERS OF CRANES; TRAMBEAM HANDLING SYSTEMS; TRACKMOBILES; FOUNDRY, RAILROAD AND CHEMICAL PROCESSING EQUIPMENT

CALENDAR
OF MEETINGS

Sept. 29-Oct. 1, American Society of Mechanical Engineers and American Institute of Electrical Engineers: National power conference, Statler-Hilton Hotel, Boston. Information: ASME, 20 W. 39th St., New York 18, N. Y.

Sept. 29-Oct. 3, American Society of Tool Engineers: Semiannual meeting and western tool show, Shrine Exposition Hall and Statler-Hilton Hotel, Los Angeles. Society's address: 10700 Puritan Ave., Detroit 21, Mich. Executive secretary: Harry E. Conrad.

Sept. 29-Oct. 3, Society of Automotive Engineers: Aeronautic meeting and production forum and aircraft engineering display, Ambassador Hotel, Los Angeles. Society's address: 485 Lexington Ave., New York 17, N. Y. Secretary: John A. C. Warner.

Oct. 3-4, American Ceramic Society Inc.: Refractories division meeting, Bedford Springs Hotel, Bedford, Pa. Society's address: 4055 N. High St., Columbus 14, Ohio. General secretary: Charles S. Pearce.

Oct. 5-8, Packaging Machinery Manufacturers Institute: Fall meeting, French Lick-Sheraton Hotel, French Lick Springs, Ind. Institute's address: 60 E. 42nd St., New York 17, N. Y. Executive director: Russell L. Sears.

Oct. 6-8, Truck Body & Equipment Association Inc.: Annual meeting and exhibit, Ambassador Hotel, Atlantic City, N. J. Association's address: 1616 K St. N. W., Washington 6, D. C. Executive manager: Arthur H. Nuesse.

Oct. 8-10, American Management Association: Special conference on "Planning Products That Sell," Biltmore Hotel, New York. Information: Research & Development Division, AMA, 1515 Broadway, New York 36, N. Y.

Oct. 8-10, Gray Iron Founders' Society Inc.: Annual meeting, Sheraton Park Hotel, Washington. Society's address: 930 National City-E. 6th Bldg., Cleveland 14, Ohio. Executive vice president: Donald H. Workman.

Oct. 8-10, American Society of Mechanical Engineers and American Institute of Mining, Metallurgical & Petroleum Engineers: Joint solid fuels conference, Chamberlin Hotel, Old Point Comfort, Va. Information: AIME, 29 W. 39th St., New York 18, N. Y. Secretary: E. O. Kirkendall.

Oct. 13-15, National Electronics Conference Inc.: Annual meeting and exhibit, Sherman Hotel, Chicago. Conference's address: 84 E. Randolph St., Chicago 1, Ill. Executive secretary: John S. Powers.

Coming in STEEL

Oct. 20

Metal Selector

Having trouble keeping up with special metals? STEEL's Selector will bring you up to date. It covers the entire field—from space age metals just emerging from the nation's metallurgical laboratories to the more familiar materials that have many applications. The 1958 edition of the Selector will include:

SUPERSTRENGTH STEELS—Used where maximum usable strength (about 300,000 psi) and minimum weight are of primary importance.

VACUUM MELTED METALS—Vacuum induction and consumable electrode melting tailor these alloys to specific requirements of strength, heat resistance, and workability.

HIGH TEMPERATURE ALLOYS—Requirements of materials for aircraft and missile service make this chart one of the most important in the Selector.

CAST HIGH ALLOYS—Two groups will be listed: Corrosion resistant alloys for service below 1200° F and heat resistant alloys for service above 1200° F.

SPRING ALLOYS—Included in this group will be high carbon spring materials, flat high-carbon types, alloy steels, valve spring steels, stainless types, copper-base, nickel-base, cobalt-base, and constant modulus alloys.

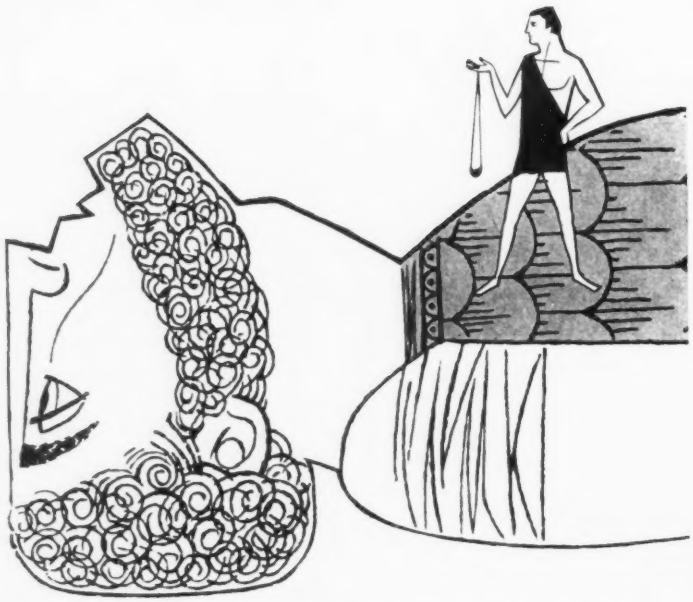
HIGH STRENGTH STEELS—This chart will include the high strength, low alloy steels that have about 50 per cent higher strength than structural carbon steels.

LEADED STEELS—All carbon and alloy bar grades will be listed. Improved machinability, the outstanding property of the leaded steels, results in higher feeds and speeds, better finishes, and longer tool life.

●

Watch for the Oct. 20 issue! You'll want to keep the Metal Selector on your desk for handy reference. It's your guide to special metals and the companies you'll be buying them from.

why use GOLIATH when "DAVE" can do the job at **1/2** the cost?

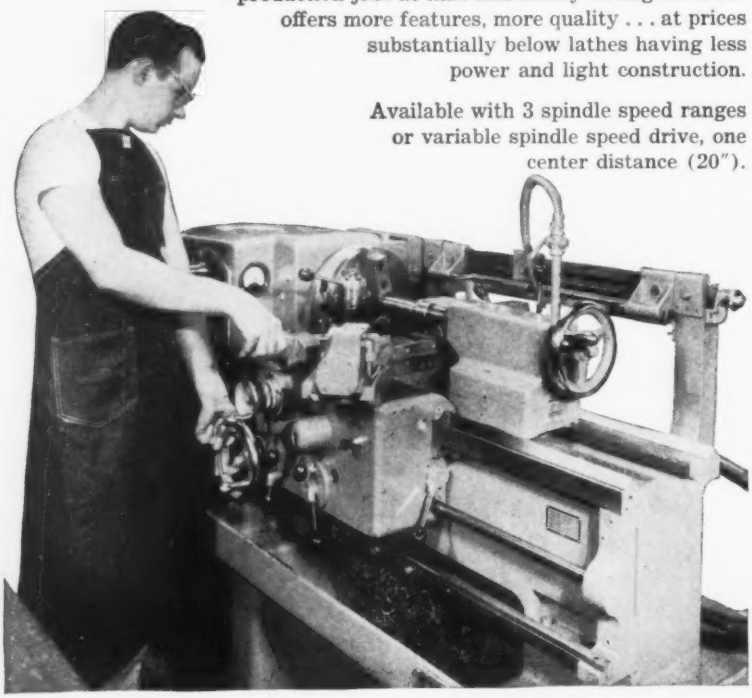


don't pay $20,000 when you can buy a LODGE & SHIPLEY Hi-Turn COPYMATIC TRACER LATHE for less than $10,000

A too-big, too-expensive tool doesn't mean you'll do the job quicker, better or at lower cost. There's new proof of that fact . . . in the 1307 (10") HI-TURN 45° COPYMATIC Tracer Lathe!

This rugged and versatile lathe is built to do production jobs at time and money-saving rates . . . offers more features, more quality . . . at prices substantially below lathes having less power and light construction.

Available with 3 spindle speed ranges or variable spindle speed drive, one center distance (20").



"EXCELLENT FOR HIGH PRODUCTION ON SMALL PARTS," says Indiana Gear Works, Indianapolis

This well-known precision gear manufacturer has a number of Lodge & Shipley lathes in a busy plant. The latest is a Hi-Turn COPYMATIC, evaluated as follows:

SPEED RANGE:
"The wide range of speeds available on this machine is definitely an advantage."

FEED RANGE:
"We are able to select the correct feed for all parts run on the machine."

DINABRAKE MOTOR:
"Speeds production."

HP AMMETER:
"Enables the operator to run the machine at full capacity."

DESIGN:
"Compact, provides ease of set-up."

ACCURACY:
"Good."

For complete details, request Bulletin DM-4 from:

The Lodge & Shipley Co.
3070 Colerain Ave.
Cincinnati 25, Ohio

Big Paul digs and dumps 105 tons in 50 seconds!

USS "T-1" and TRI-TEN Steels cut dead weight—boost strength

Even from a 100-foot-high perch, the mammoth size of the bucket of Big Paul, the King of Spades, is hard to comprehend.

There are three of these 70-yard giants—all built by Marion Power Shovel Company. All achieve strength and toughness with least weight by the use of USS "T-1" Constructional Alloy Steel and USS TRI-TEN High-Strength Low-Alloy Steel.

Big Paul sets the pace at the Peabody Coal Company's River King mine near Freeburg, Illinois. It rams through rock and shale to uncover some two million tons of coal per year.

Since 1950, the art of big shovel making has increased dipper size from 35 to 45, 55, 60, and now 70 cubic yards per bite. Most of the buckets and dipper sticks of these giant shovels are made of USS "T-1" Steel, for otherwise, it would be almost impossible to make them light enough and tough enough. They hold up in this service, taking terrific impact abrasion and shock loading, even in the dead of winter. This is possible because USS "T-1" Steel retains its toughness at temperatures far below zero.

Dipper Size Increased 25%

USS "T-1" Steel has often enabled a boost in the capacity of original equipment without increasing weight. For example, a 20-yard bucket was replaced with a 24-yard "T-1" Steel job. Other dippers were boosted from 26 yards to 32, and 36 yards to 45—increases of 25%.

Many other parts—dipper stick, bail handles and crowd rack—are built stronger and lighter with this 90,000 psi minimum yield strength constructional alloy steel. (USS "T-1" Steel plates up to 2½ inches thick inclusive are *now* available with a minimum yield strength of 100,000 psi.)

The booms and A-frames of most shovels over 45 yards are designed with high-strength low-alloy steels with 50,000 minimum yield point . . . usually USS TRI-TEN Steel.

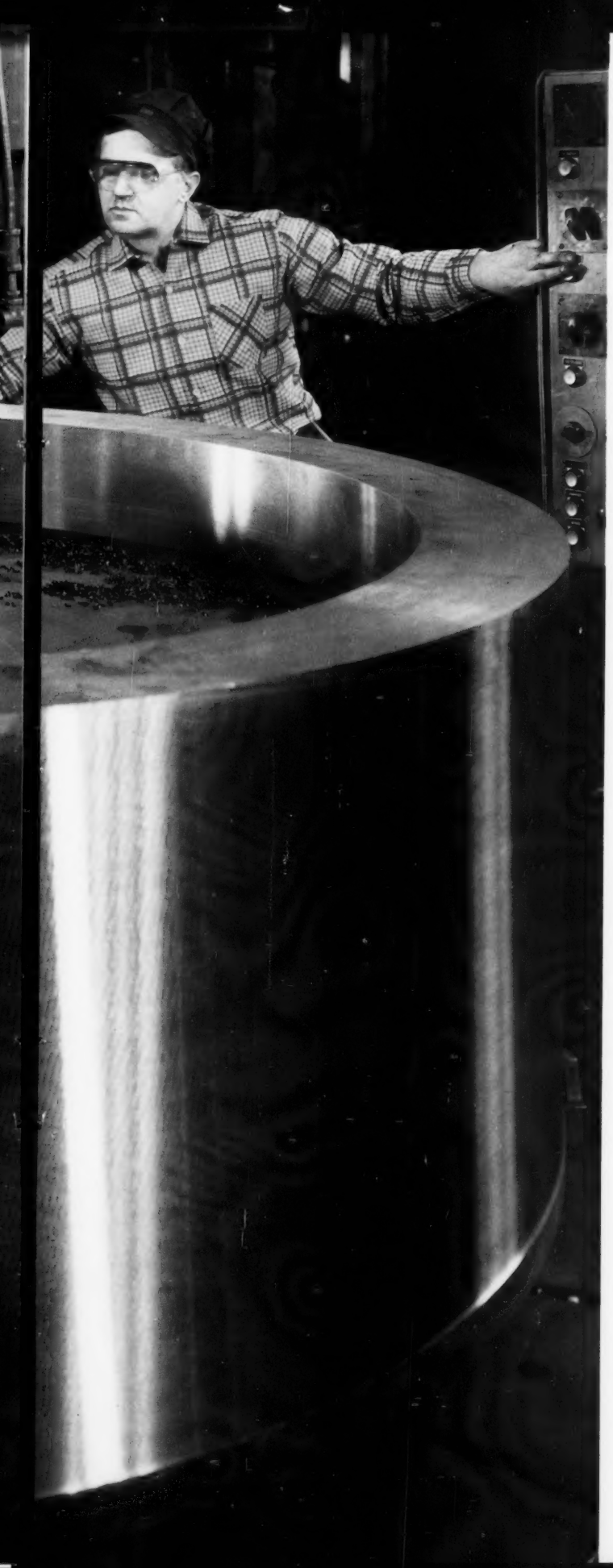
Perhaps you need a steel that offers higher yield strength, extraordinary toughness and resistance to impact abrasion, combined with relative ease of fabrication. USS "T-1" Steel is your answer, and we'll gladly help you adapt it to your application. For free booklet, write United States Steel, 525 William Penn Place, Pittsburgh 30, Pennsylvania

USS, "T-1" and TRI-TEN are registered trademarks

◀ 70-yard dipper and handle, crowd rack, bail and sheave blocks—all built stronger and lighter with USS "T-1" Steel.

United States Steel Corporation – Pittsburgh
Columbia-Geneva Steel – San Francisco
Tennessee Coal & Iron – Fairfield, Alabama
United States Steel Supply – Steel Service Centers
United States Steel Export Company

United States Steel



12 tons of forged steel for Yankee fission

The picture shows a steam generator tube sheet forging (one of four) destined for a 134,000-KW nuclear-fueled power plant owned by the Yankee Atomic Electric Company, in Rowe, Massachusetts.

It's a $50-million plant that uses a pressurized water reactor. The USS Quality Forging tube sheet is 85″ in diameter by 26 7/16″ thick. Some 1600 holes will be drilled through the forging longitudinally, and in these holes will be placed stainless steel tubes which will carry high pressure, high temperature main coolant water.

The forged tube sheet is made from carbon steel with a pinch (.057%) of vanadium in it. Starting from the raw ingot, it was heated, forged, rough machined, normalized, tempered, rough machined again, then quenched and tempered. It received a great variety of tests along the way—including several ultrasonic tests. The forging, as shipped, weighed 25,500 pounds.

Nuclear power plant designers have known from the beginning that it is extremely important to use highest quality components. That's the reason why they come so often to United States Steel for its justly famous USS Quality Forgings. And although the one shown here is not complicated, the Forgings Division of USS Homestead District Works has produced a great many complex forgings in everything from carbon to stainless steel, including discs, tapered domes, flanges and cylinders of all types.

No matter what kind of a forging you need, isn't it a good feeling to know that the men who will make it have a solid background of experience? We'd appreciate your inquiries or requests for our free folder on USS Nuclear Forgings. Just write United States Steel, 525 William Penn Place, Pittsburgh 30, Pa.

USS is a registered trademark

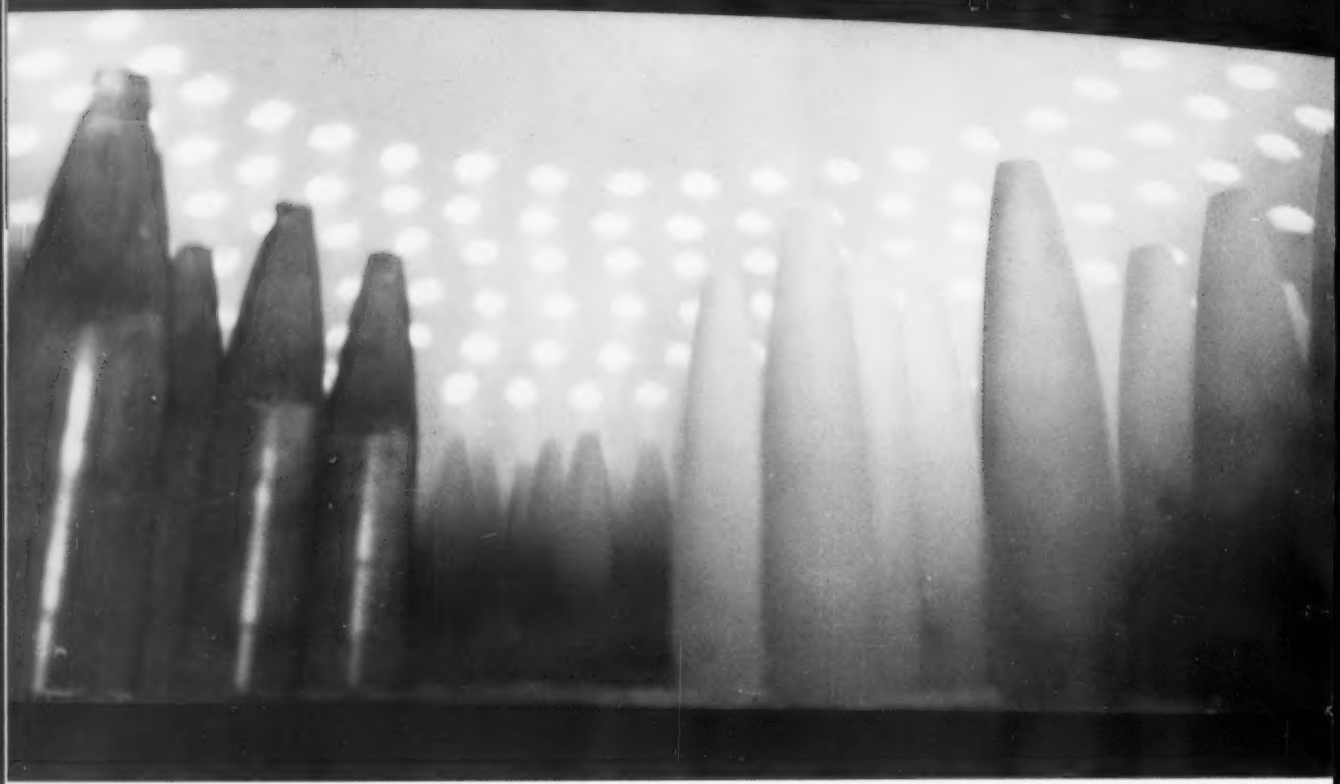
USS

United States Steel Corporation – Pittsburgh
Columbia-Geneva Steel – San Francisco
Tennessee Coal & Iron – Fairfield, Alabama
United States Steel Export Company

United States Steel

ATLAS LUMNITE

IN REFRACTORY CONCRETE DOME:



Circular Revolving Hearth Furnace featuring an unusual inner dome constructed with a castable refractory bonded with LUMNITE calcium-aluminate cement. Furnace diameter is 17 feet; 9" thick concrete dome has 289 holes (5" diameter). Heat passes downward through dome openings to anneal shells in furnace.

. . . for low cost furnace construction and maintenance

- Refractory concrete (with ATLAS* LUMNITE cement) stands up under continuous soaking heat . . . protects against thermal shock due to heating-cooling cycles . . . provides insulation.
- Easy, economical to place . . . by precasting, troweling or guniting . . . concrete reaches high strength 24 hours after placing.

For maximum convenience, use castables made with LUMNITE* cement. These are packaged mixtures, ready for use. Simply add water, mix and place. Made and distributed by leading manufacturers of refractories.

UNIVERSAL ATLAS CEMENTS

Write for "Lumnite Refractory Concrete Manual"—
Universal Atlas, 100 Park Avenue, New York 17, N. Y.

Universal Atlas Cement
Division of United States Steel

USS

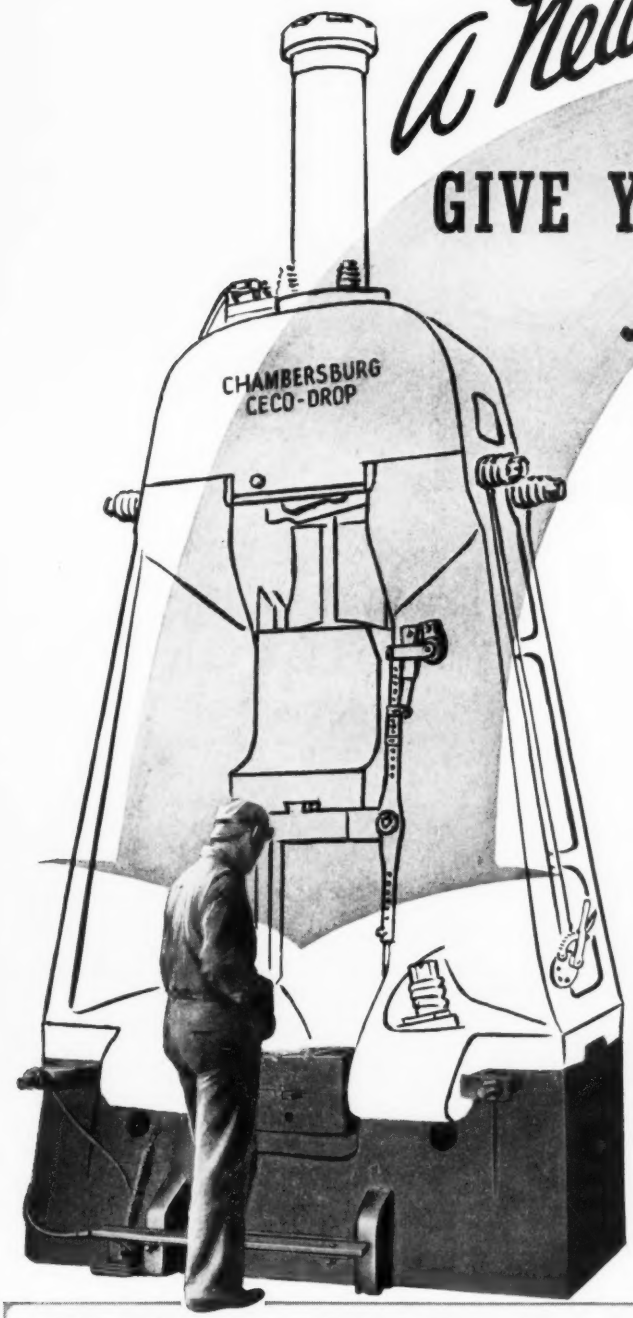
*TRADE MARK

L-176

OFFICES: *Albany · Birmingham · Boston · Chicago · Dayton · Kansas City · Milwaukee · Minneapolis · New York · Philadelphia · Pittsburgh · St. Louis · Waco*

GIVE YOUR BOARD DROP HAMMERS *a New lift!*

GIVE YOUR OPERATORS *New life!*



YOUR PRESENT ANVILS PLUS CECO-DROP UPPERWORKS

can mean quick modernization at a minimum cost and can put new life in your operators

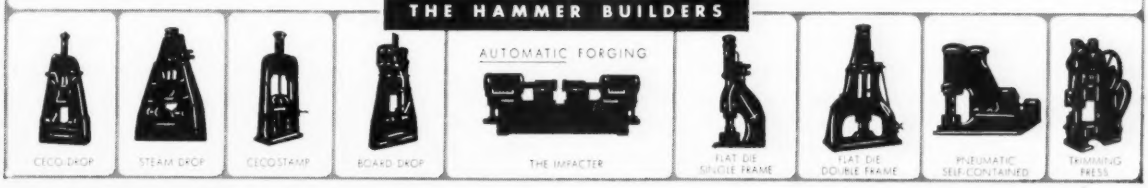
Here's a good suggestion: You can install Ceco-Drop upperworks on your existing board drop hammer anvils. Thus at a considerable saving you will be in a position to meet and beat tomorrow's stiff competition. You will produce more accurate forgings at a lower cost through more continuous production. You will have the most modern forging hammers available. Your hammermen will end their shifts fresh and still full of pep.

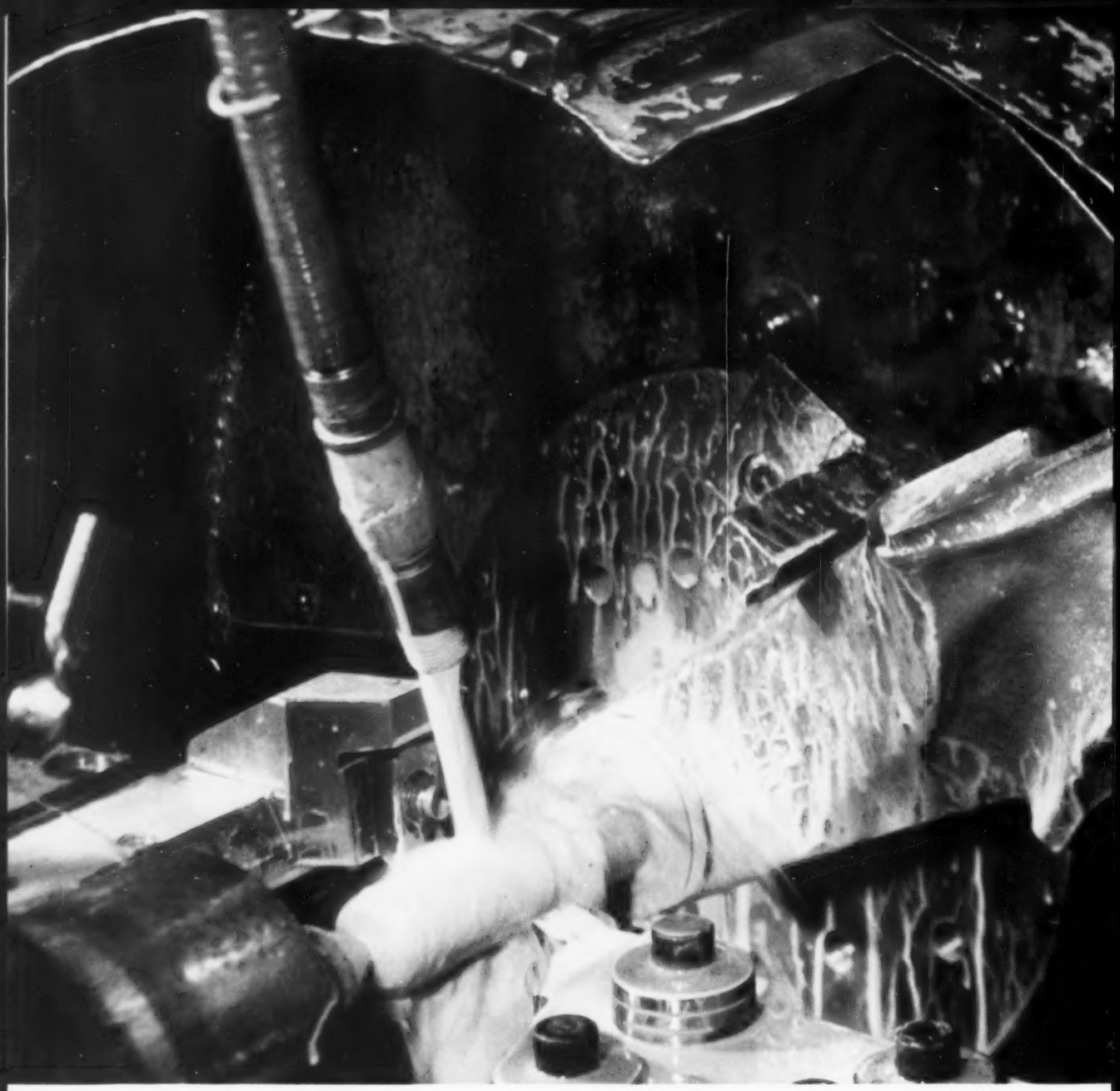
That's part of the Ceco-Drop story. The rest is in Bulletin 80-L-7 a copy of which will be sent on request. Write today.

CHAMBERSBURG ENGINEERING CO., CHAMBERSBURG, PA.

CHAMBERSBURG

THE HAMMER BUILDERS





Ups cutting oil life 12 times with Gulfcut . . . more proof that

GULF MAKES THINGS

Not only the life of cutting oil, but the odor of it when rancid had once been a thorny problem in the Oil Tool Division of Reed Roller Bit Company, Houston, Texas, a major producer of oil well drilling tools.

Here's how they solved both problems with Gulfcut Heavy Duty Soluble Oil. Before they switched to Gulfcut, one department was changing cutting oils on the average of every two weeks. Reason: premature rancidity.

If the oil wasn't changed that often, the objectionable odor would become a personnel problem. Because it was changed that often, at least two man-hours were lost each time a machine was cleaned out. On top of this was the unnecessary cost of replacing oil that frequently.

The previous oil also tended to "clabber up" in the storage drums, especially in cold weather. This made it difficult to prepare the coolant charges. Reed solved all these problems with Gulfcut Heavy Duty Soluble Oil.

They reduced the frequency of cutting oil changes from an average of every 2 weeks to an average of every 6 months. Gulfcut Heavy Duty gave them over 12 times the service life! They had no more trouble with rancidity or solidification in storage.

What's more, in a water-oil ratio of 10-to-1, Gulfcut Heavy Duty Soluble Oil gives Reed's machinists the

Proof in production. These components for the new Reed Y tri-cone drilling bit were precision-bored in a turret drill cooled and lubricated with Gulfcut H.D. Soluble Oil. Boring operation at 550 sfpm. Carbide tool speed: 1,675 rpm. Cutting oil life in this operation: 6 months.

The Gulf man is there. Gulf Representative Jeff Bolling, right, talks to Reed shop superintendent A. R. Whiltsie about the merits of Gulfcut Heavy Duty Soluble Oil—which is used in a total of 21 lathes and drills in the Lugs and Bridges Department. All of the work involves alloy steels.

RUN BETTER!

constant work temperature and lubricity they need—for accurate sizing and desired surface finishes.

How about your operation? Gulfcut Heavy Duty Soluble Oil cuts machining cost through: longer cutting oil life, increased tool life, finer finishes, closer tolerances —and freedom from rancidity, foaming and solidification in storage.

Get the full efficiency-economy story on Gulfcut Heavy Duty Soluble Oil now. See how Gulf makes things run better, operation-wise and cost-wise. Call a Gulf Sales Engineer at your nearest Gulf office. Meanwhile mail coupon for new illustrated bulletin.

GULF

GULF OIL CORPORATION
Dept. DM, Gulf Building
Pittsburgh 30, Pa.

Send me illustrated bulletin on Gulfcut Heavy Duty Soluble Oil.

Name_____

Title_____

Company_____

Address_____

City_____ Zone____ State_____

SP-9363

This valve gets a leak-proof seal from a Blanchard Surface Grinder

"The Blanchard Surface Grinder is one of the most important improvements in our modernization program." This report comes from the Commercial Refrigeration Division of Bendix-Westinghouse Automotive Air Brake Company—makers of power and condensing units for refrigeration equipment.

The Blanchard No. 18 Surface Grinder puts a surface of 5 micro inches or better on Bendix-Westinghouse valves at the rate of 75 pieces an hour.

A Blanchard Model 18 Surface Grinder is used to finish grind valve plates used in Bendix-Westinghouse electric refrigeration compressors. They say: "This operation is very important, because—with a surface finish of five micro inches or better—we get a perfect seal on our gaskets and valves, eliminating the possibility of leakage."

Is there room for improvement in *your* surface grinding? For best results...

Write today for your free copy of "Work done on the Blanchard," fifth edition, and "The Art of Blanchard Surface Grinding," fourth edition.

PUT IT ON THE BLANCHARD

THE BLANCHARD MACHINE COMPANY

64 STATE ST., CAMBRIDGE 39, MASS., U. S. A.

PROPOSALS SOLICITED FOR LEASE OF DEPARTMENT OF THE ARMY INDUSTRIAL FACILITIES

All or portions of the above installations are available for use for commercial purposes. Possible uses are unlimited.

Facilities: Oleum plants (sulphuric acid); nitric acid; acid concentration; ether still; nitrocellulose; various explosive manufacturing; organic chemical manufacturing; steel foundries; heavy and light manufacturing; loading and assembling; offices; warehouses; power plants; storage tanks; many other facilities.

Transportation: Rail and highway facilities are available to these installations, including intra-plant rail and road systems.

Utilities: All necessary utilities are available.

Labor: There is a surplus of both skilled and unskilled labor in the immediate vicinity of most plants.

Detailed information, arrangements for inspections, invitations for proposals and sample form of lease may be obtained from the U. S. Army Division Engineer having jurisdiction over the area in which you are interested. The addresses of the Divisions Engineers are:

MISSOURI RIVER
PO Box 1216
Omaha, Nebr.

OHIO RIVER
PO Box 1159
Cincinnati, Ohio

NORTH ATLANTIC
90 Church St.
New York 7, N. Y.

SOUTH ATLANTIC
PO Box 1889
Atlanta, Georgia

NORTH CENTRAL
536 So. Clark St.
Chicago 5, Ill.

SOUTH PACIFIC
PO Box 3339
Rincon Annex
San Francisco, Calif.

SOUTHWESTERN: 1114 Commerce St., Dallas, Texas

MISSOURI RIVER
1. Cornhusker Ordnance Plant, Grand Island, Nebr.
2. Iowa Ordnance Plant, Burlington, Iowa
3. Kansas Ordnance Plant, Parsons, Kansas
4. Lake City Arsenal, Independence, Mo.
5. Nebraska Ordnance Plant, Wahoo, Nebr.
6. Rocky Mountain Arsenal, Denver, Col.
7. St. Louis Ordnance Plant, St. Louis, Mo.
8. St. Louis Ordnance Steel Foundry, St. Louis, Mo.
9. Sunflower Ordnance Works, Lawrence, Kansas

NORTH ATLANTIC
1. Birdsboro Ordnance Steel Foundry, Birdsboro, Pa.
2. Burlington Ordnance Plant, Burlington, N. J.
3. Edgewood Arsenal, Edgewood, Md.
4. Ordnance Assembly Plant, Edgewood, Md.
5. Radford Arsenal, Radford, Va.

NORTH CENTRAL
1. Badger Ordnance Works, Baraboo, Wisc.
2. East Chicago Ordnance Steel Fdy., East Chicago, Ind.
3. Joliet Arsenal, Joliet, Ill.
4. Kingsbury Ordnance Plant, La Porte, Ind.
5. Twin Cities Arsenal, New Brighton, Minn.
6. Wabash River Ordnance Works, Newport, Ind.

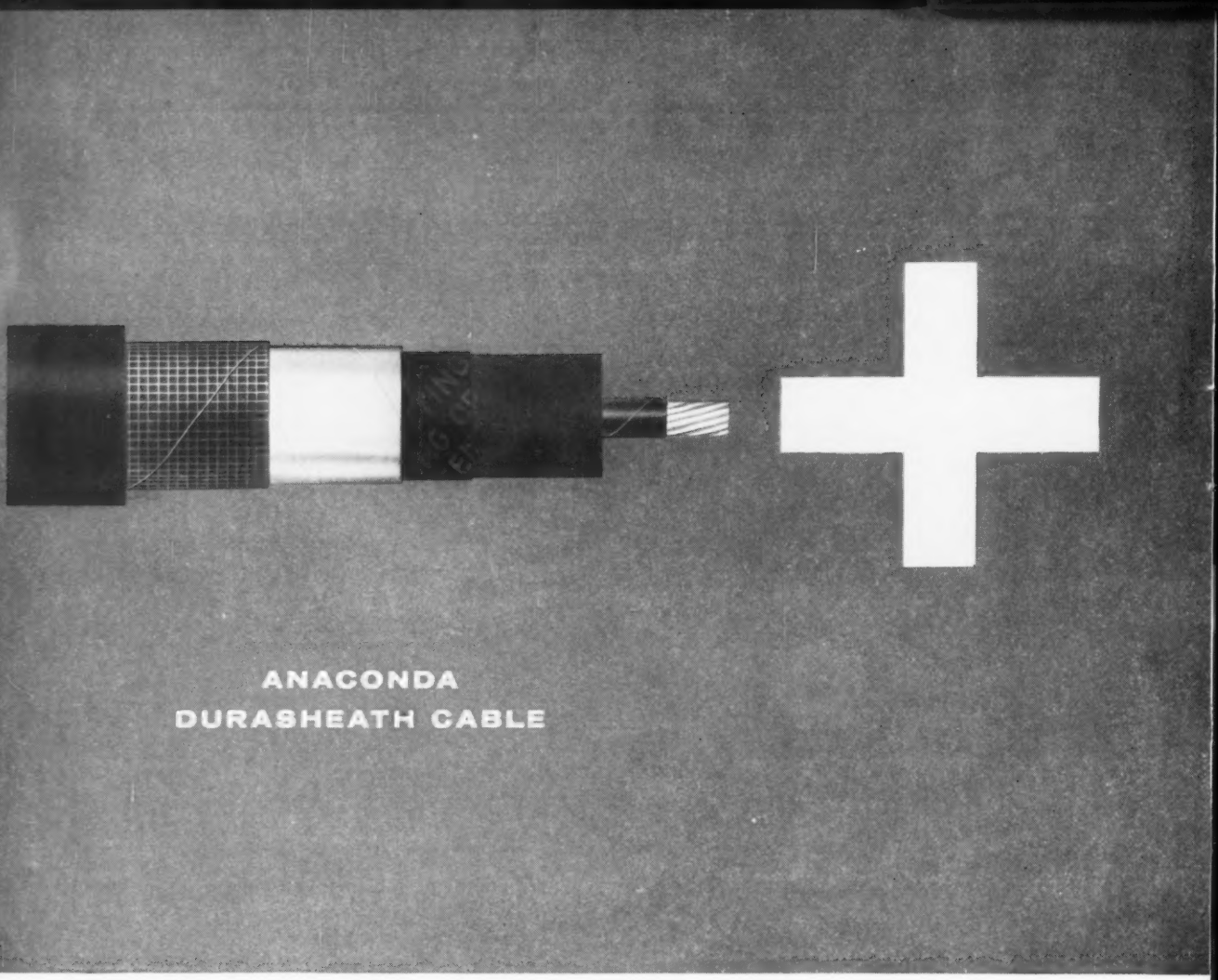
OHIO RIVER
1. Coraopolis Ordnance Steel Foundry, Coraopolis, Pa.
2. Indiana Arsenal, Charlestown, Ind.
3. Jefferson Proving Ground, Madison, Ind.
4. Lima Ordnance Steel Foundry, Lima, Ohio
5. Marshall Plant, New Martinsville, W. Va.
6. Ravenna Arsenal, Apco, Ohio
7. Ridgewood Ordnance Plant, Cincinnati, Ohio

SOUTH ATLANTIC
1. Alabama Ordnance Works, Childersburg, Ala.
2. Holston Ordnance Works, Kingsport, Tenn.
3. Milan Arsenal, Milan, Tenn.
4. Phosphate Development Works, Sheffield, Ala.
5. Volunteer Ordnance Works, Tyner, Tenn.

SOUTH PACIFIC
1. Pacific Ordnance Steel Foundry, Pittsburg, Calif.
2. Riverbank Ordnance Plant, Riverbank, Calif.

SOUTHWESTERN
1. Lone Star Ordnance Plant, Texarkana, Texas
2. Longhorn Ordnance Works, Karnack, Texas
3. Louisiana Ordnance Plant, Shreveport, La.
4. Oklahoma Ordnance Works, Pryor, Okla.
5. Pantex Ordnance Plant, Amarillo, Texas

CORPS OF ENGINEERS, U.S. ARMY



Anaconda Durasheath rubber-insulated, neoprene-jacketed power cable and Anaconda splicing kits were made for each other—and for you. Together, they make your wiring job easier, faster, more economical.

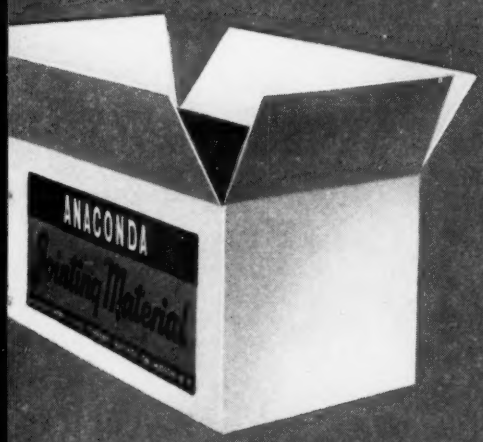
Anaconda Durasheath. First, Anaconda Durasheath* provides a superior-quality power cable with a proven record for safety, dependability, long life. Its flexibility and its versatility can effect important savings in your installed-costs budget.

A special abrasion-resistant neoprene jacket makes it possible to install Durasheath three ways: aerially, in ducts, or underground . . . in continuous runs with minimum splices. Durasheath's light weight permits use of lighter supports . . . longer spans.

Anaconda Accessories. Where splices are necessary, Anaconda Accessories – all fully engineered by cable experts – come into the picture. For in an Anaconda Jointing Kit you have every item you need for a single splicing job. No time lost assembling the necessary materials – or going back for forgotten items. The job is simplified, takes minimum time. In addition, responsibility is concentrated because your cable and your cable accessories have come from the same dependable manufacturer – Anaconda!

See the Man from Anaconda today about Durasheath power cable (5 kv., 15 kv. and higher) and Anaconda Jointing Kits. Write for Bulletin DM-5817 on Anaconda Durasheath Cable and Bulletin C-79-13-14 on Anaconda Accessories. Anaconda Wire & Cable Co., 25 Broadway, New York 4, N. Y.

*Trademark 58977



MONEY SAVINGS
TIME SAVINGS
EASY INSTALLATION
SURE CONNECTIONS
PROVED
PERFORMANCE
CONCENTRATED
RESPONSIBILITY

ANACONDA
FULLY ENGINEERED
JOINTING KITS

ANACONDA DURASHEATH ALL-PURPOSE POWER CABLE

Available in all sizes, single and multiple conductor, copper or aluminum, 600 to 15,000 volts and higher.

Insulations: Type RHW, Anaconda ANW, AHW or AB, each designed for specific purposes and described fully in new publication DM-5817.

Jacket: Specially compounded neoprene with high resistance to flame, oil, acids, alkalis, sunlight and ozone; has high tensile strength and flexibility! Densheath (PVC) and Polyethylene jackets are available for special applications.

An Anaconda Jointing Kit assures the right materials for the job when and where you need them. Shown above: contents of kit for 3-conductor, shielded-type rubber-insulated Durasheath cable. Similar kits also available for solid-type, varnished-cloth, thermoplastic- and paper-insulated cables.

LIVE BETTER ELECTRICALLY

SEE THE MAN FROM **ANACONDA**
FOR **DURASHEATH AND ACCESSORIES**

YEARS OF PROFITABLE PRODUCTION

BUILT INTO

"BUFFALO"

NO. 18 DRILLING MACHINES

These drills are constructed to provide the longest possible useful life and the utmost accuracy in operation. Easy to set up and operate, the rugged, dependable No. 18 is designed to cut production costs in a wide variety of operations.

Quality Features of the "Buffalo" No. 18 Drill:

- **SPINDLE** — Multiple-splined alloy steel, ground, polished and carefully balanced. Rotates in two precision-type ball bearings, designed to take the thrust of heavy-duty operations. Design of spindle pulley bearings prevents torque being transmitted directly to spindle.

- **FRAME** — Large, heavy head frame insures accuracy throughout life of machine.

- **TABLES AND BASES** — Built to extra-heavy proportions, with large working surfaces.

- **RAISING SCREW** — Full ball bearing construction, actuated by machine-cut steel screw and gears. Three ball thrust bearings provide easy operation.

- **FOOT FEED** — Operated by a gear meshing the feed pinion. Foot treadle return by torsion spring, giving maximum return pressure at end of stroke.

For capacities up to 1" in cast iron, the "Buffalo" No. 18 Drill is your best buy. Available in floor and bench models — bench types up to 6 spindles.

Contact your "Buffalo" machine tool dealer for full information on the No. 18 Drill, or write us direct for Bulletin 3123-E.

Every "Buffalo" Machine Tool brings you the exclusive "Q" Factor—the built-in QUALITY which provides trouble-free satisfaction and long life.

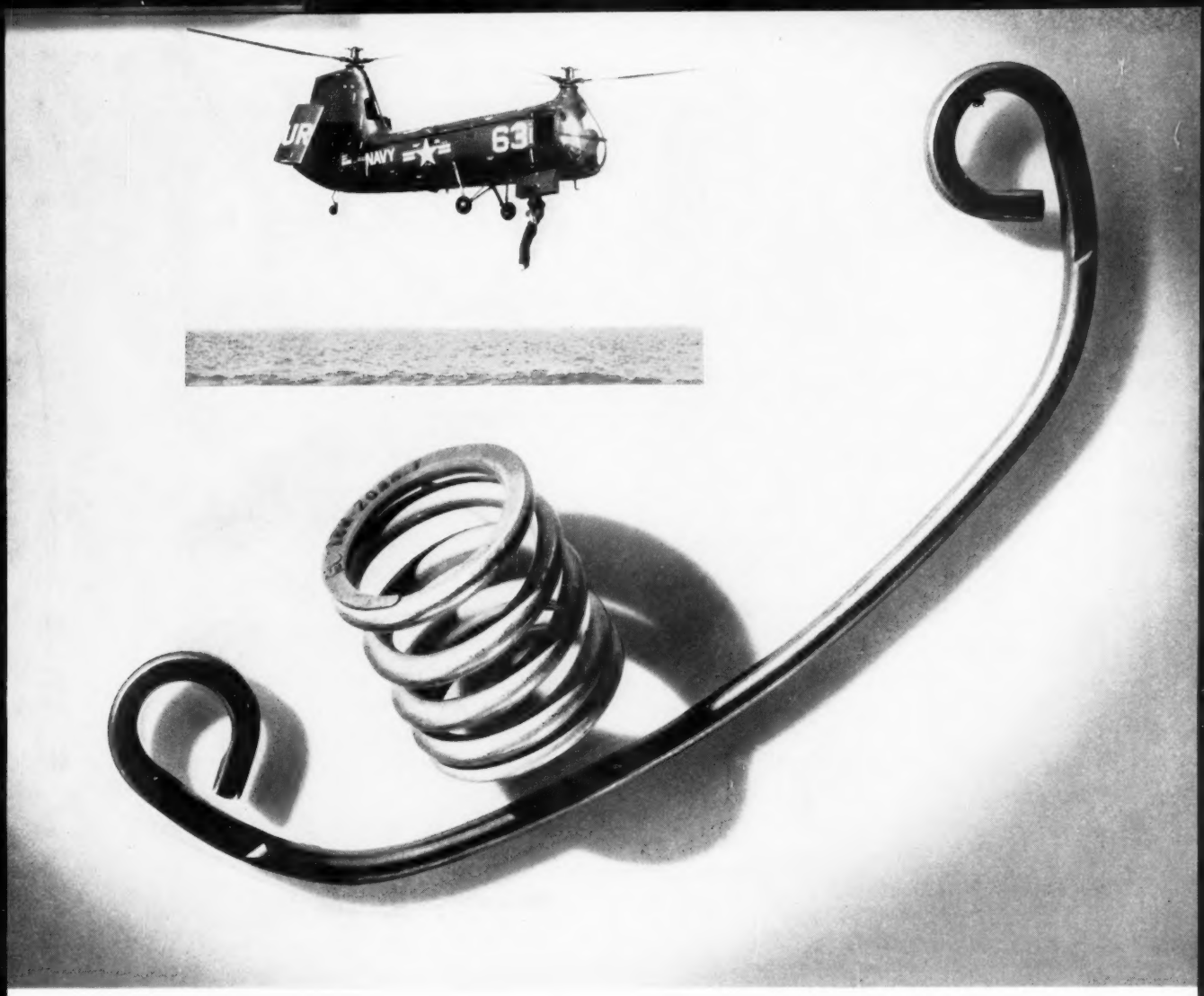
ESTABLISHED 1877 "Buffalo" MEMBER N.M.T.B.A.

BUFFALO FORGE COMPANY

158 MORTIMER STREET • BUFFALO, N. Y.

Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

DRILLING PUNCHING SHEARING BENDING



Up with the Whirlybirds . . .

What helps this helicopter hover? It's an engineering principle — angle of tilt of rotor blades and speed of revolution. What's at the heart of the rotor assembly? Among other things, this rugged spring and tension bar made by an A.S.C. Division. The same exacting "aircraft quality" that produces these and hundreds of other high duty aircraft springs is available to manufacturers in any industry whose standards demand the best.

Write for a copy of "How to Solve Your Spring Design Problems" to learn how early consultation with the spring manufacturer results in improved design and performance.

Associated Spring Corporation

General Offices: Bristol, Connecticut

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Seaboard Pacific Division, Gardena, Calif.
Cleveland Sales Office, Cleveland, Ohio
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Dunbar Brothers Division, Bristol, Conn.
Wallace Barnes Steel Division, Bristol, Conn.

Canadian Subsidiary: The Wallace Barnes Co., Ltd., Hamilton, Ontario and Montreal, Quebec

8803

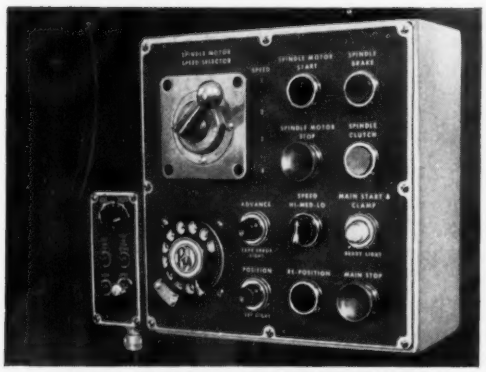
BIGGEST

Work-Size Capacity

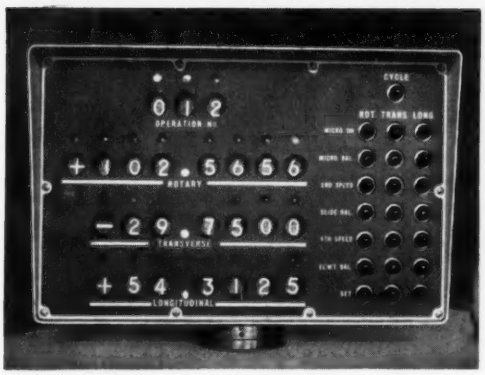
. . . ever offered in a Precision Jig Borer!

the New PRATT & WHITNEY 4EA

with 70-inch height capacity from table to spindle end



NEW DIAL-TYPE CONTROL STATION



NEW INPUT DATA DISPLAY PANEL

This new P&W Jig Borer provides the extra capacity you need to handle large components. And – locating to *.0001"* – it has the dependable accuracy you need to meet the high standards of the aircraft, missile, nuclear energy and other industries where extreme precision is a must. Table-top-to-spindle-end maximum distance is 70", with a combined travel of head and quill of 64". As a result, the spindle can be brought within 6" of the table surface. It has the capacity to machine to the center of a workpiece 80" in diameter. Despite its greatly increased height, the 4EA Jig Borer has an accuracy of vertical alignment equal to that of all Pratt & Whitney Jig Borers. This is made possible, by an entirely new column design, with the counterbalances supported by an independent superstructure and not by the column itself.

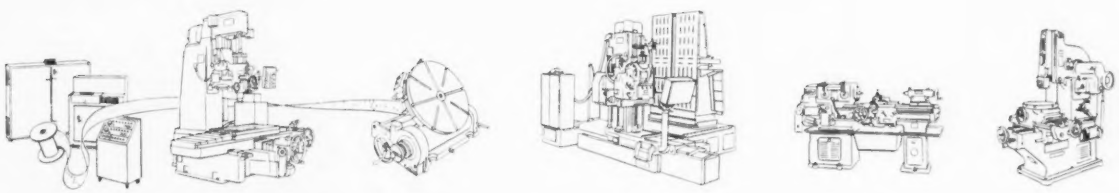
NEW DIAL-TYPE NUMERICAL CONTROL

To bring the greatest possible speed and efficiency to your high-precision jobs . . . and eliminate operator errors . . . the 4EA Jig Borer is equipped with P&W Numerical Control. This system provides for automatic positioning of the rectangular work table and, if desired, for the built-in rotary table as well.

Under P&W Numerical Control, the 4EA Jig Borer can be positioned automatically by a punched tape or – where tape control is not desired – the operator can feed positioning data into the machine using either of the 2 Control Stations. These compact stations feature a new control system that allows the operator to *dial* positioning data as quickly and easily as he dials a phone number. Since one of these stations is located at the front of the bed and the other on the spindle head, one will always be handy to the operator's hand. Operating under either tape or dial control, input data is always clearly indicated on a Display Panel located on top of the Tape Reader. This provides a continuous double-check on the correctness of positioning data.

If your jobs demand big *capacity and extreme precision combined with peak production efficiency, the new Pratt & Whitney 4EA Jig Borer has* everything *you need to handle your work faster and more accurately. Write now for more complete information on the 4EA and on other P&W Precision Jig Borers.*

PRATT & WHITNEY COMPANY, INC.
13 Charter Oak Blvd., West Hartford, Conn.



NUMERICAL CONTROL . . . JIG BORERS . . . ROTARY TABLES . . . KELLER MACHINES . . . LATHES . . . VERTICAL SHAPERS

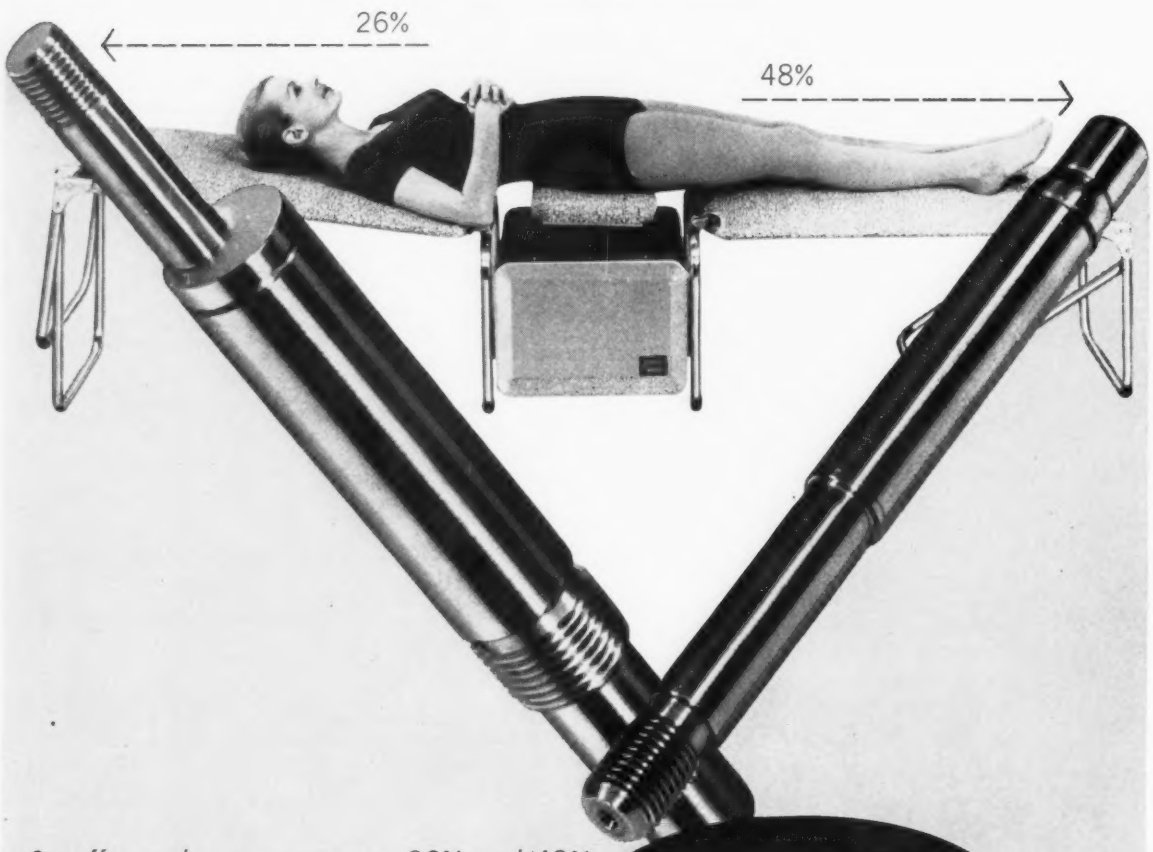
PRATT & WHITNEY

FIRST CHOICE FOR ACCURACY

MACHINE TOOLS • GAGES • CUTTING TOOLS

SHE is improving her figure on a Stauffer "Magic Couch." And although she doesn't know it, Stauffer makes two of the Magic Couch's most important operating parts from La Salle ground and polished STRESSPROOF® steel bars. This means that her Magic Couch will last longer, will be more dependable.

Stauffer reduces cost figures, too!



Stauffer reduces part costs 26% and 48% by using ground and polished *La Salle* STRESSPROOF® STEEL BARS WITH COPPER

ELIMINATES Heat Treating

This eccentric shaft . . . and this idler shaft, two of the most important parts of Stauffer's Magic Couch, were formerly made of heat treated C-1137. But Stauffer design engineers recommended a change to La Salle ground and polished STRESSPROOF® steel bars . . . with copper.

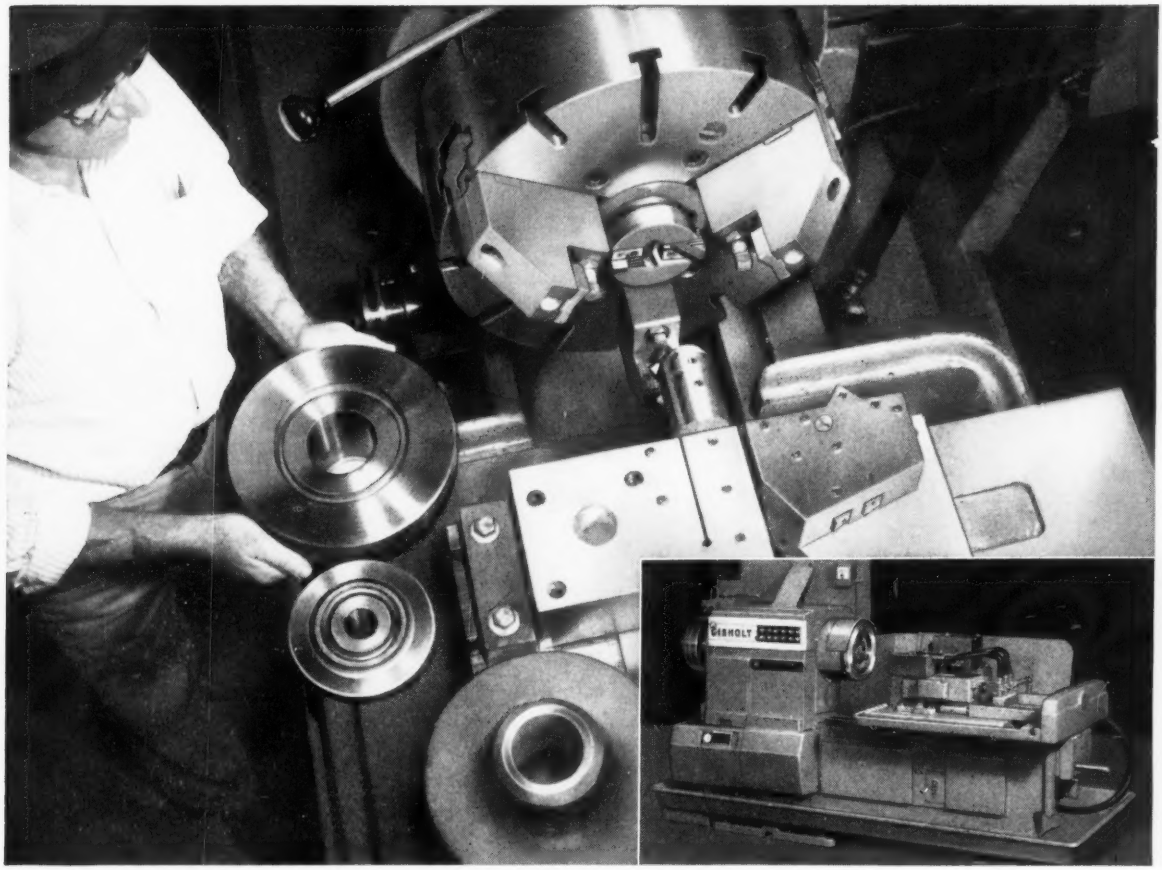
The result: no need for rough grinding . . . no need for heat treating. Production costs were reduced 26% on the eccentric shaft . . . 48% on the idler shaft.

La Salle ground and polished STRESSPROOF® can help your per-part cost. It gives high strength without heat treating . . . it machines 50% to 100% faster than heat treated alloys . . . it minimizes warpage . . . it makes a better part at a lower cost.

To find out how STRESSPROOF® can help you, just write for a copy of Helpful Data Bulletin No. 15, "Improve quality . . . cut costs" . . . or for production applications ask for a sample bar for test purposes.

La Salle STEEL COMPANY

1414 150th Street, Hammond, Indiana



Smart planning on Simplimatic holds f.t.f. time to 1.7 min. on 6½" diam., 3.3 min. on 10¾" diam. workpieces.

How OTM Corp. cuts costs machining parts in 13 sizes

Handles each part in single chucking, using Simplimatic with back-facing attachments and two-speed motor

You may get ideas from the way OTM Corporation, Houston, Texas, machines steel welding neck flanges and welding necks—with each part in 13 different sizes—completing each part in a single chucking and holding change-over time to an absolute minimum.

Here's how the job is done on a Gisholt Simplimatic Automatic Lathe: Facing, grooving, boring and chamfering operations are performed from tools on short tool slides, with T-slotted tops for quick adjustment. Relieving the boring tool at the end of the cut eliminates tool tracks. Simultaneously, a special back-facing attachment works through the spindle to shave-face and chamfer the O.D. on the hub. A power chuck wrench operates the scroll chuck and permits mounting this attachment in the spindle bore. A two-speed motor provides correct surface speed and permits switching from high speed (for turning and facing) to low speed (for grooving operation) and back again, during the Simplimatic's automatic machining cycle.

Here, again, the Gisholt MASTERLINE Simplimatic Automatic Lathe saves a manufacturer the cost of a special machine. Its extra wide platen table provides ample space for an infinite number of slide and tool arrangements—and its table feed permits tools to engage with the work or perform additional machining operations before actual slide movements begin. Ask your Gisholt Representative to show you how the Simplimatic performs special machine functions at standard machine prices—on your product and under your production conditions.

MASTERLINE GISHOLT SINCE 1887 GISHOLT

GISHOLT MACHINE COMPANY
Madison 10, Wisconsin, U.S.A.

ASK YOUR GISHOLT REPRESENTATIVE ABOUT GISHOLT FACTORY REBUILT MACHINES WITH NEW MACHINE GUARANTEE

Copper-Coated Strip, shown before heat-treat at Victor Adding Machine, prevents distortion of precision parts during case hardening of working surfaces.

Plain Steel number dials are welded to precision-made Thomas Strip.

Victor Adding Machine, Others Cut Costs, Improve Products With Thomas Strip

Manufacturers across the country are reporting new cost-cutting, quality-boosting results from their use of Thomas Strip's cold-rolled specialty steels.

At Victor Adding Machine Company, Chicago, for example, copper-coated Thomas Strip slashed one major production cost by 50% and made big savings in another operation.

Fred E. Rolli, Victor's chief engineer, says Thomas Strip is "the greatest single improvement in our production process in the past 10 years."

Here's why:

Victor's deluxe Model 75 contains 2500 individual parts, 68 of the most critical being made from Thomas Strip, both plain and copper-coated.

• **Distortion-Free.** Load-bearing parts—with tolerances under .001 inch, plus or minus, have to be case hardened along their sheared edges. Heat-treating plain steel (15 minutes at 1450 degrees) can warp the stamping. Often the expensive straightening process caused tiny surface cracks which elongated the part past the .001-inch tolerance.

To solve this problem, Victor turned to copper-coated Thomas Strip. Since the electrolytic layer of copper stops off or blocks carburizing gases, flat surfaces of the stamped part are protected. Then, plain steel edges case harden properly. The part retains flatness and proper ductility. Since there is no distortion, piece straightening of copper-coated parts is eliminated. This accounts for the 50% reduction of the total straightening operation at Victor.

• **More Savings.** A second economy begins in the punch press. Die-life is a vital factor of production costs. Like other users of copper-coated Thomas Strip, Victor finds die-life between grindings is extended as much as 33%. This is due to the lubrication effect of the copper coating.

A third benefit: uniform temper and on-spec composition of Thomas Strip mean clean, burr-free sheared edges. Burrs, like slivers, are banes of close-tolerance operation of machine parts.

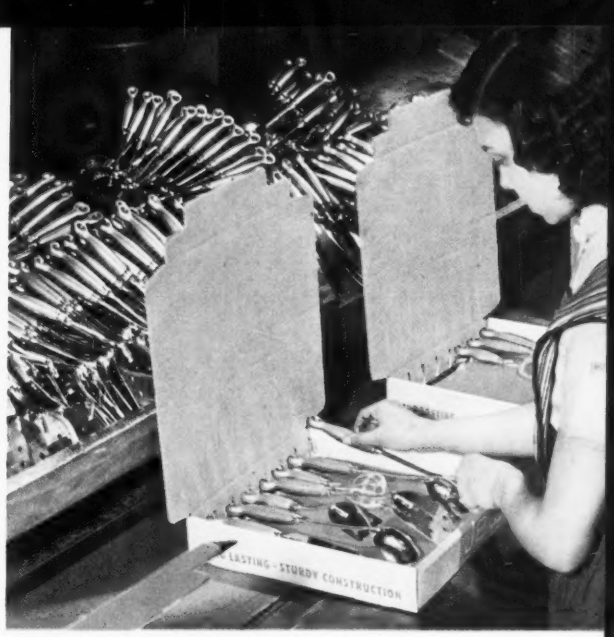
• **Satisfied.** Engineer Rolli sums it up by saying:

"Elimination of straightening is one of the biggest boons to small parts manufacturers that I've seen in the business. Even if Thomas Strip had no other benefits than eliminating a production problem, using copper-coated strip would be entirely worthwhile."

Thomas Strip's advantages are the same throughout industry. Other examples of how manufacturers cut costs, improve products—get higher profits and increase sales are shown here.

Thomas Strip's newly expanded and diversified production facilities give you the full range of products on these pages, in addition to zinc and chrome coatings . . . or hot-dip coated with lead alloy or tin. Uncoated Thomas Strip products include low carbon, alloy and high carbon spring steel grades.

Steel's Strength, Brass' Beauty are combined economically to form lock-joint tubing at Van Huffel Tube Corp., Warren, Ohio. Largest producer of rolled shapes in the nation, Van Huffel uses clear-lacquered, brass-coated Thomas Strip to make tubing for variety of products, including curtain rods and lamps. Thomas' brass and lacquer coatings easily withstand forming pressures and resist roll damage to the finish. Tubes usually need no further surface finishing. Van Huffel has been a satisfied Thomas Strip user for 26 years.



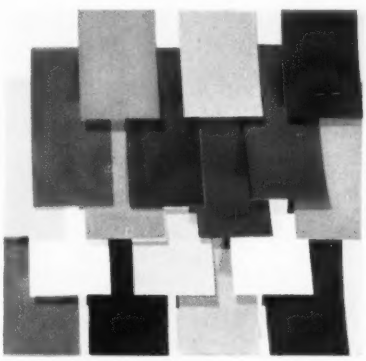
Capacity Up 25%, Sales Up 45% since Automatic Wire Goods Manufacturing Co., Bronx, New York, started using Thomas' nickel-plated strip 5 years ago. President Irving Spiegel says Thomas Strip boosted quality, kept production costs constant, improved appearance and design of his extensive Jewel and Automatic kitchen utensil lines. Thomas nickel-coated strip assures a mirror-like finish, an important feature of sales appeal in the highly competitive utensil field.

All Thomas Strip products can save you money and enhance your product in six important ways:

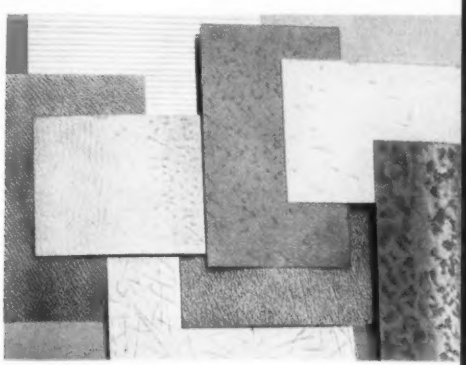
- **Fabricates Easily.** Coated steels stand fully as much fabrication as uncoated strip.
- **Longer Die Life.** Most coatings lubricate dies, reduce wear and increase tool life.
- **Maximum Pieces Per Pound.** Precision rolling to extremely close size tolerances gives more square feet of strip per ton.
- **Lower Plating Costs.** Coatings serve as final product finish or as base for further plating or painting.
- **Speeds Fabrication.** Thomas Strip coatings eliminate costly intermediate fabricating steps such as cleaning, buffing, even plating.
- **Steel's Strength and Economy** are combined with beauty and utility of more expensive metals.

All the savings and benefits Thomas Strip specialties are giving to fabricators shown here are available to you. A national sales staff—familiar with design and fabrication advantages of Thomas Strip is ready to serve you.

Write for samples, and additional cases of users' actual experiences with Thomas Strip products. Do it today!



The Rainbow's Range of colors, lacquered or painted on precision cold-rolled strip will solve your decorative and design problems. Thomas Strip's new lacquer line is the industry's finest. It's capable of wider widths in a fuller range of colors, especially pastel shades. Besides appearance, lacquer-coated steel is rugged and can be readily formed or mildly drawn without damage to the product's finish.



Unlimited Design opportunities come with pattern-rolled strip. New facilities enable Thomas to offer wider widths of any design and coating, including clear or colored lacquer. Users agree pattern-design enhances product sales appeal, permits production economies by eliminating piece buffing and costly further finishes. Pattern-designs stand up under tough forming operations and still offer attractive, flaw-free surfaces.

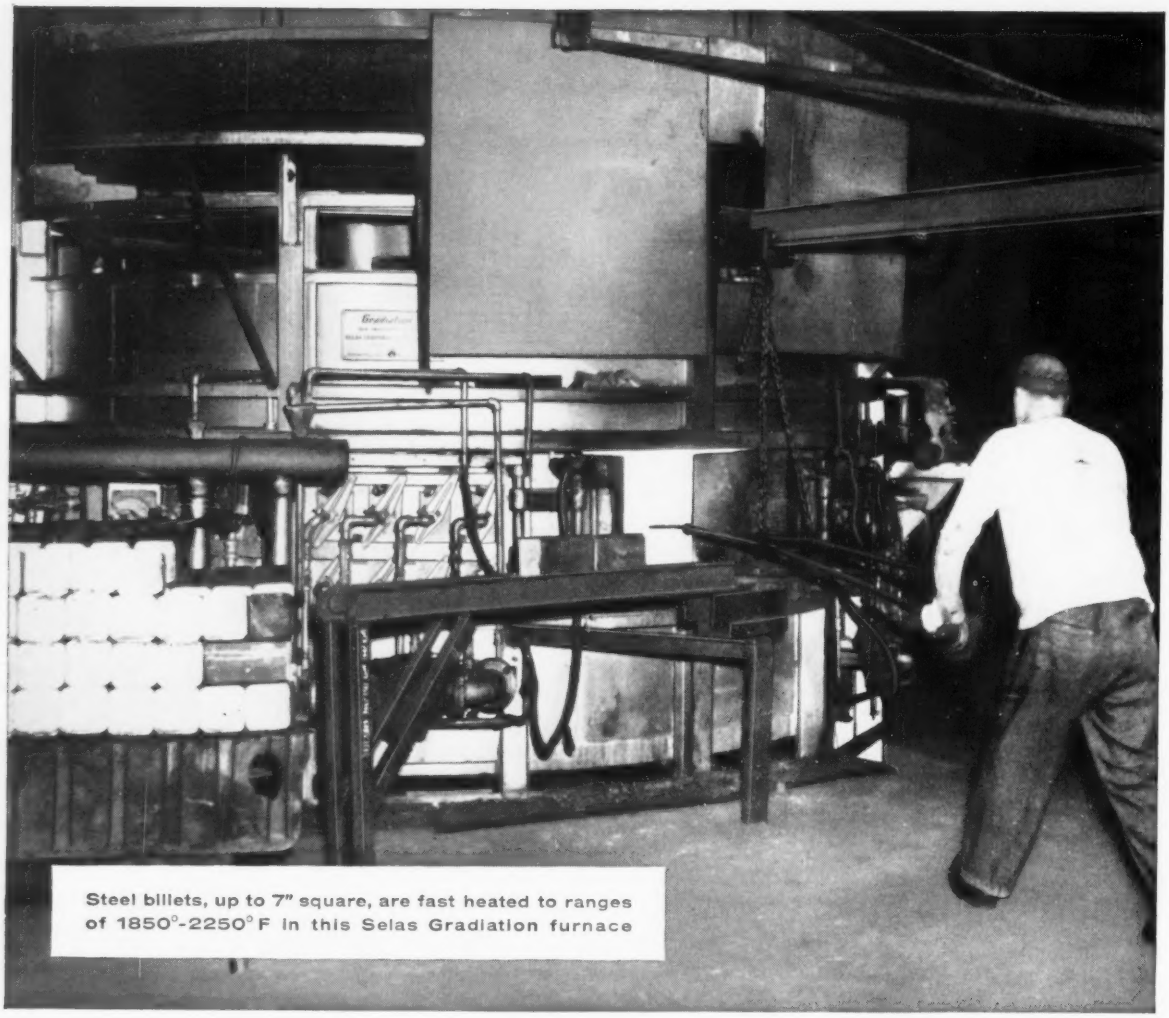
Thomas Strip® Division

Pittsburgh Steel Company

Grant Building · Pittsburgh 30, Pennsylvania

District Sales Offices:

Atlanta	Cleveland	Dayton	Los Angeles	Pittsburgh
Chicago	Dallas	Detroit	New York	Tulsa
		Houston	Philadelphia	Warren, Ohio



Steel billets, up to 7" square, are fast heated to ranges of 1850°-2250° F in this Selas Gradiation furnace

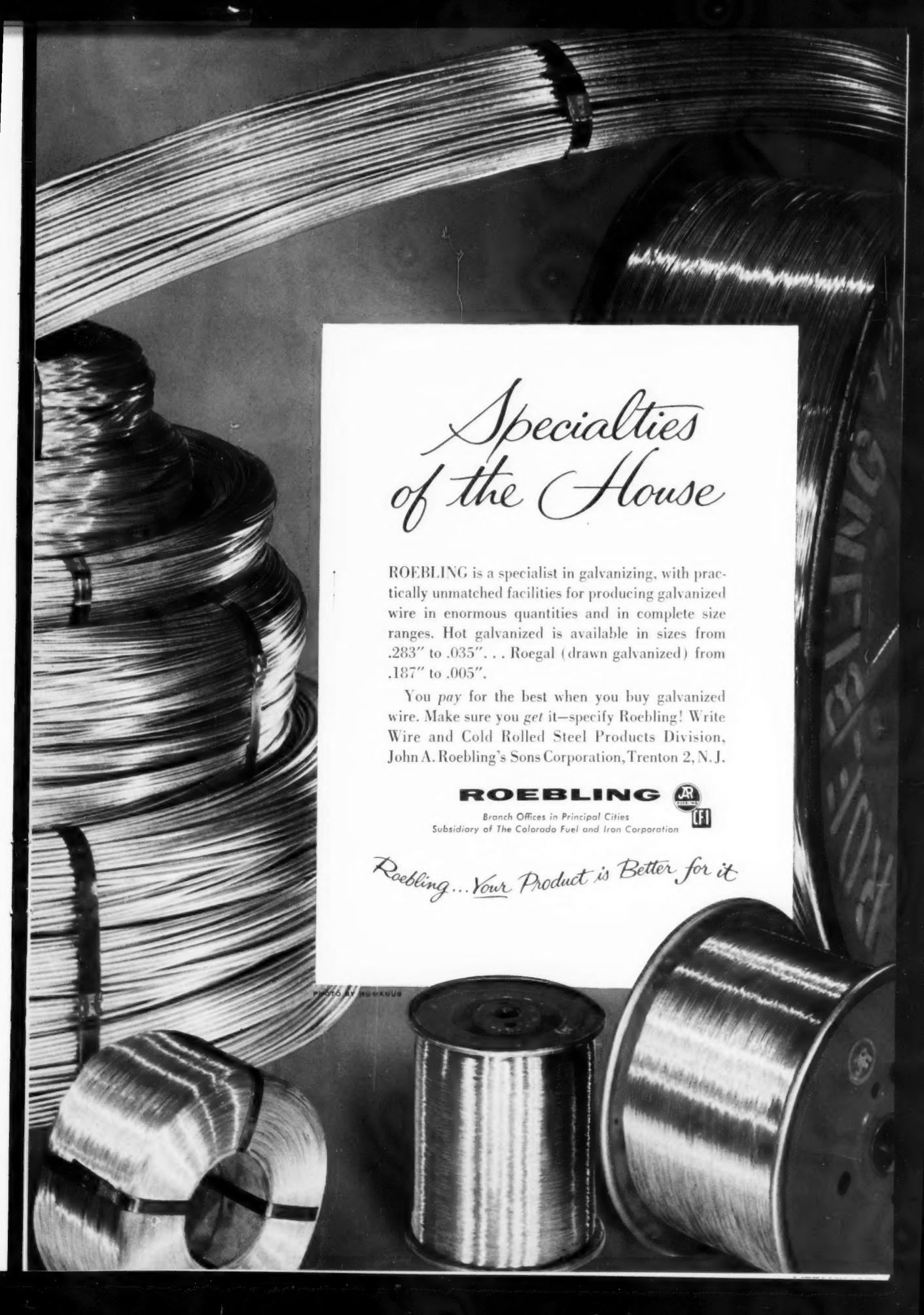
FAST HEATING WITH *GAS*

- improves forgeability
- reduces power requirements
- increases metal flow

A Gas-fired Gradiation® furnace designed and built by Selas Corporation for Lansdowne Steel and Iron Company, Morton, Pennsylvania heats billets to 1850°-2250° F at rates of 2 to 5 minutes per inch of thickness—thus virtually eliminating scale. Some fast heated billets are forged at temperatures 300° F below conventional methods.

Improved forgeability, directly attributable to fast heating with Gas, reduces power requirements at the usual forging temperatures. Or, for given power applied, permits an increase in the amount of flow or deformation.

For information on how Gas equipment can help you in your production operations, call your Gas Company's industrial specialist. He'll be glad to discuss the economies and outstanding results you get with Gas and modern Gas equipment. *American Gas Association.*


Specialties
of the House
ROEBLING is a specialist in galvanizing, with practically unmatched facilities for producing galvanized wire in enormous quantities and in complete size ranges. Hot galvanized is available in sizes from .283" to .035"... Roegal (drawn galvanized) from .187" to .005".
You pay for the best when you buy galvanized wire. Make sure you get it—specify Roebling! Write Wire and Cold Rolled Steel Products Division, John A. Roebling's Sons Corporation, Trenton 2, N. J.
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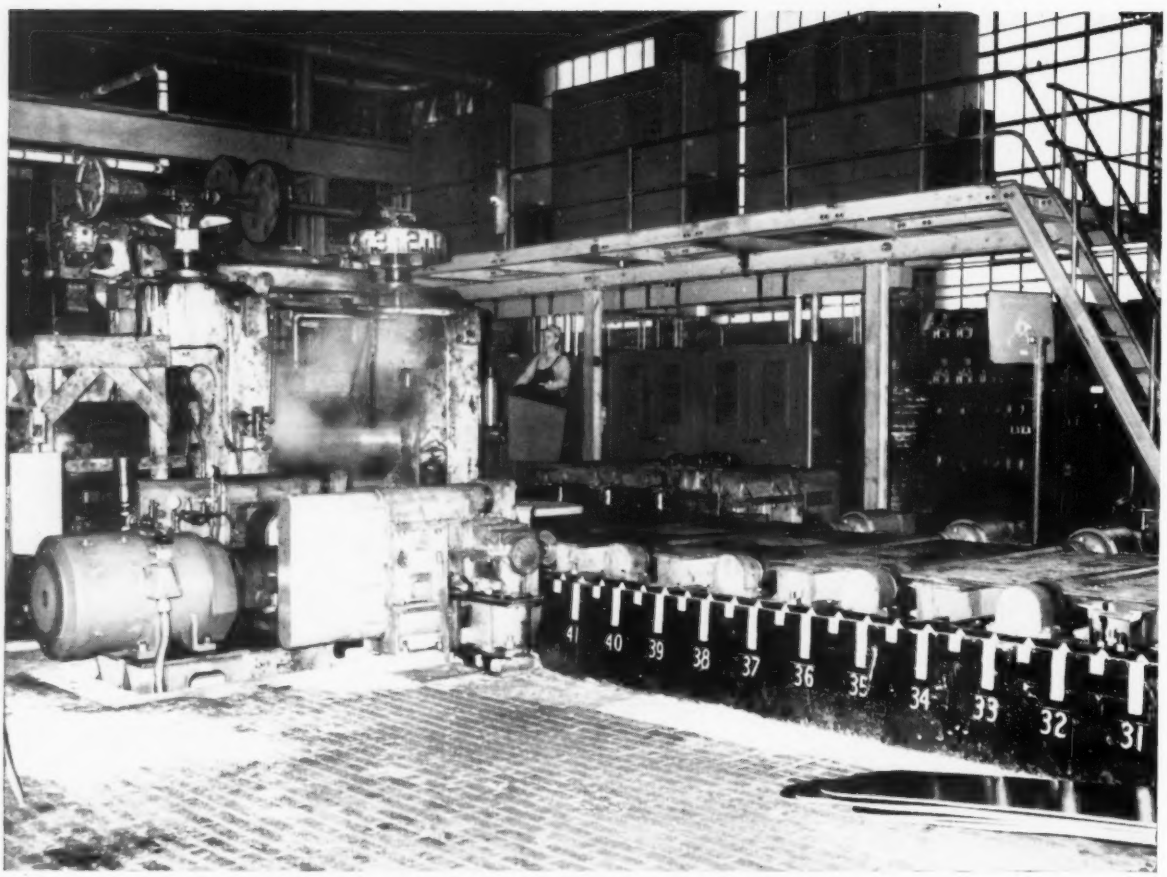

Packaged M-G sets and controls are located right at the hot mill in Revere Copper and Brass, Incorporated's New Bedford, Mass. plant

Reliance Packaged Drives cut Modernization Cost 20%

Instead of one large motor-generator set, Revere Copper and Brass, Incorporated used five packaged V★S Drives to power the edger and tables on their rebuilt hot mill.

Reliance Drives package the M-G sets with controls and put them right at the mill itself. Conduit runs are of minimum length, which reduced not only material costs but construction time.

Control installation was vastly simplified. Each V★S Unit was prewired and pretested before shipping. The complete V★S Cabinets had only to be set in place and connected. Extra construction was not required for a generator room.

Packaged V★S Drives cut costs for Revere and gave more flexibility of operation and greater ease of maintenance. Reliance Packaged Drives will reduce drive installation and operating costs for any type of mill.

For complete details contact your Reliance representative, or write today for Bulletin No. D-2506. L-1586

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Warehouses stocking Allegheny Ludlum's Tool and Die Steels are located conveniently throughout the country. There's one near you. Jot down its phone number and call the next time you have a problem or need steel.

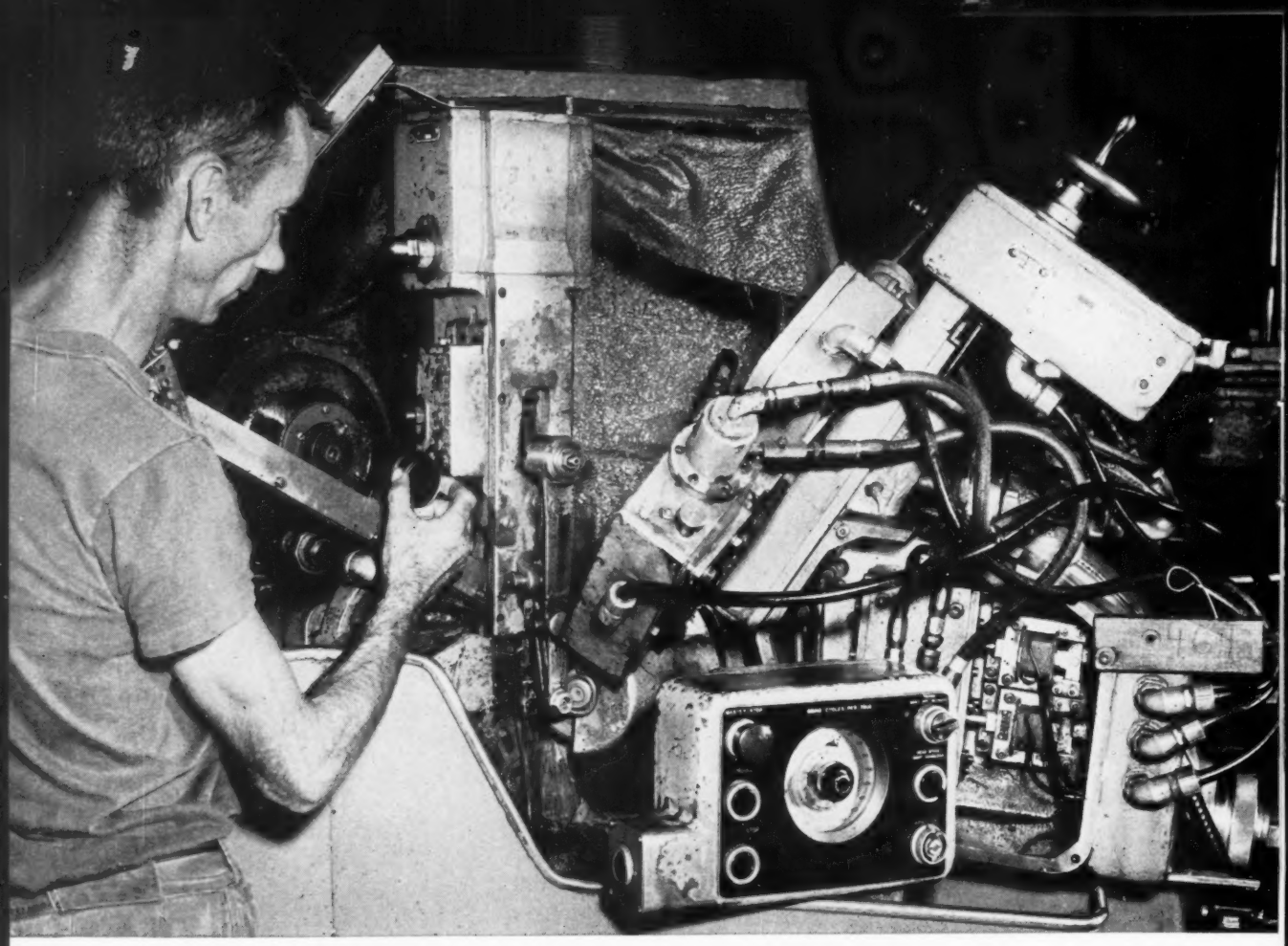
Allegheny Ludlum stocks a complete line of tool steel sizes and grades. Call your nearest A-L representative; you'll get quick service and counsel on such problems as heat treating, machining, grade selection, etc. Or write for A-L's publication list which gives full data on the more than 125 technical publications offered. They'll make your job easier.
ALLEGHENY LUDLUM STEEL CORPORATION, Oliver Building, Pittsburgh 22, Pa. Address Dept. S 9B.

WBW 7265

ALLEGHENY LUDLUM

Tool Steel warehouse stocks throughout the country... Check the yellow pages

every grade of tool steel... every help in using it



bearing life boosted from

THREE WEEKS TO FOUR YEARS

with Texaco Cleartex Oil

Tyson Bearing Corp., Division of SKF Industries, Massillon, Ohio, extended the life of micro-centric grinder bronze sleeve bearings from 3 weeks to 4 years (and they're still going strong) using *one* oil—Texaco Cleartex B—for both grinding *and* machine lubrication.

Before Cleartex was used, machine bearings would fail in about 3 weeks, because the lubricant became contaminated by grinding oil. With Cleartex this problem simply doesn't exist. A premium quality lubricant, Cleartex is *also* a fine grinding oil. In fact, Tyson now gets as many as 20 pieces per wheel dressing, each with a better finish, compared to the 10 or 12 that were previously obtained.

You can do any machining work better, faster and at lower cost with Texaco—a complete line of cutting, grinding and soluble oils. A Texaco Lubrication Engineer will gladly help you select the right ones for your job. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write: The Texas Company, 135 East 42nd Street, New York 17, N. Y.

LUBRICATION IS A MAJOR FACTOR IN COST CONTROL

(PARTS, INVENTORY, PRODUCTION, DOWNTIME, MAINTENANCE)

End of the Rarick Rebellion?

Steelworker President Dave McDonald and his colleagues hope they can forget the Rarick rebellion. A convention-passed resolution to expel Don Rarick and his few backers who dared to continue their protests about high dues probably will lie dormant unless the "dual unionists" continue to be obstreperous.

How United Steelworkers Have Gained

Basic steelworkers are the nation's highest paid, followed by petroleum, aluminum, publishing, aircraft, can, and auto personnel. Steel people were fourth in 1952 when Mr. McDonald became president of the union, behind publishing, petroleum, and autos. In 1952, aluminum held the ninth wage place, the can industry, the twelfth. Both are segments of the United Steelworkers.

SUB and Indiana

USW has come up with this method of getting around Indiana law which forbids an unemployed worker to supplement his state jobless pay with compensation from another source: The state pays the worker $33 a week. If he had been earning the maximum wage, he'd be entitled to SUB of $25 to bring his total jobless benefits to 65 per cent of takehome pay. Now he takes his state check to his employer, and the employer gives him a company check for $58 (or one for $33 and another for $25) in exchange, returning the state check to the state. USW's Indiana fund contains about $1.5 million. It will start paying full 65 per cent benefits Oct. 1 and will pay out to the workers as much as they would have received had payments not been suspended. When SUB is exhausted, unemployed workers will receive state benefits as before. When the private funds get big enough so that payments can be made for four weeks, they'll be resumed with the same procedure. Ohio workers can't draw SUB, but the case goes before the state's Supreme Court beginning Oct. 7.

'59 Construction: Up Slightly

Total construction volume in 1959 will be only slightly larger than the $50 billion estimated for 1958, predicts H. C. Turner Jr., president of Turner Construction Co. The breakdown: Public awards, up 5 per cent; housing up slightly; industrial building, down 15 per cent.

Machinery Makers Look to 1960s

Machinery and equipment sales should hit $45 billion by 1967, compared with $30 billion, the peacetime high, in 1957, predicts Albert S. Burgoyne, vice president for manufacturing of E. W. Bliss Co. But we'll have some lean years before the promise of the 1960s is realized. The 1958 orders of machinery and equipment (motors, generators, controls, engines, farm and

Technical Outlook—Page 85 Market Outlook—Page 113

construction equipment, and machine tools) are about 15 per cent below 1957's, and the 1959 orders are expected to be about 8 per cent lower.

How To Boost Productivity

U. S. output per manhour will have to double by 1978 if gains in education, leisure, and living standards are to continue at the present rate, says Henry B. du Pont, vice president and director, E. I. du Pont de Nemours & Co. Mr. Du Pont bases his premise on the prediction that each person in 1978 will require twice as much goods and services as he uses today. He adds that the goal can be achieved only by adoption of modern instrumentation processes, since it is unlikely that enough additional manpower can be made available.

Wanted: Minerals Policy

A sound national minerals policy for the aluminum industry must have these three essential elements, says Lawrence Litchfield Jr., vice president, Aluminum Co. of America: Provide permanently for the dutyfree import of bauxite; establish an import quota and surplus disposal program through negotiation with other countries; encourage research and development.

U. S. Looks Abroad for Ore

The U. S. cannot produce enough iron ore to keep its steel industry operating at full capacity for a substantial period, the American Mining Congress convention was told by Herbert C. Jackson, vice president of the congress and associate managing partner of Pickands Mather & Co., Cleveland. The iron ore executive stressed that foreign sources are a necessary supplement to our domestic production. Imports this year will account for about 30 per cent of domestic requirements. Mr. Jackson predicted further expansion in concentrating facilities in the U. S. and Canada.

Chevrolet Aims at Peak Quarter

Chevrolet Div., General Motors Corp., expects to boost fourth quarter production to one of the highest levels in postwar years, claims Edward G. Cole, division general manager. Chevrolet accounted for 28 per cent of new car registrations in the first seven months, its highest percentage since 1934. The new line will be introduced Oct. 16.

Straws in the Wind

Development of a high strength, low alloy iron powder has been announced by Republic Steel Corp. It incorporates nickel and molybdenum . . . Four new alloys that could enlarge titanium uses in missiles and aircraft have been announced by Mallory-Sharon Metals Corp. . . . A new line of aluminum-clad homes has been jointly developed by National Homes Corp., Lafayette, Ind., and Aluminum Co. of America . . . The uptrend in new orders for handling equipment will continue in 1958 and into 1959, predicts R. L. Fairbank, president of the Material Handling Institute and vice president of Towmotor Corp. . . . Despite the strikes that hit International Nickel Co. of Canada Ltd. last week at its Canadian operations, the company has enough nickel inventoried to satisfy demand well into 1959.

PROOF: B&W Refractories withstand CO and H_2 prepared atmospheres

ATMOSPHERE	APPLICATION	CONSTRUCTION	RESULTS
60% CO	Pusher Type Malleabilizing Furnace	Walls lined with B&W K-23 Insulating Firebrick backed with B&W K-20 IFB. Roof construction—9′-0″ wide sprung arch of B&W K-23 IFB.	No major rebuilding in 21 years.
40% CO	Radiant Tube Annealing Furnaces Malleable Iron Company	Bases lined with 7″ Kaocrete-A, backed with 6″ Kaolite-20. Base size—21′-9¾″ x 9′-9¼″. Temperature 1550 to 1600 F.	In service 11 years. Reducing atmosphere has no effect on the base. All portable annealing furnace bases in plant lined with B&W castables. *Maintenance costs reduced greatly.*
		Bell type covers lined with 9″ B&W K-23 IFB standard shapes in the arch, side and end walls. 13½″ K-23, with Kaowool, is used around the radiant tube openings. Cover is 22′-6″ x 10′-5½″ outside x 8′-4½″ to top of arch.	After approximately 6 years of service, lining showed no disintegration from reducing atmosphere.
65% CO	Radiant Tube Annealing Furnace	Base lined with 5½″ Kaocrete-A and 3½″ Kaolite-20 on top of 5½″ of block insulation. Base size 21′-9″ x 9′-9″. Temperature 1700 F.	Formerly heavy firebrick linings required rebuilding yearly. B&W castable construction has given more than 9 years' service. Customer standardized on B&W castables.
100% N_2 and 100% H_2	Elevator Type Annealing Furnaces Large Steel Co.	Walls lined with 9″ B&W K-23 IFB plus 3″ K-20 IFB. Furnace size 6′-0″ x 16′-0″ x 4′-0″. Temperatures in excess of 2100 F.	B&W refractories show no sign of deterioration in six furnaces of this type in 3 years' operation. Barring mechanical damage, refractories should give long additional service.
100% H_2	Rectangular Hood Type Annealing Furnaces	60 Furnaces, 24 have wall construction consisting of 18″ B&W K-26 IFB plus 2½″ K-1620 IFB. 36 units use wall of 9″ B&W K-26 IFB plus 5″ K-1620 IFB. Furnace size—12′-0″ x 8′-6″. Temperature 2150 F.	Of the 60 covers in service only 2 were rebuilt after 2 years' service. Plant masonry superintendent reports no shrinkage; estimates 15 years' additional life if not for mechanical abuse.

Consult your B&W Refractories Representative for helpful information on your prepared atmosphere problem.

B&W REFRACTORIES PRODUCTS: B&W Allmul Firebrick • B&W 80 Firebrick • B&W Junior Firebrick • B&W Insulating Firebrick • B&W Refractory Castables, Plastics and Mortars • B&W Silicon Carbide • B&W Ramming Mixes • B&W Kaowool

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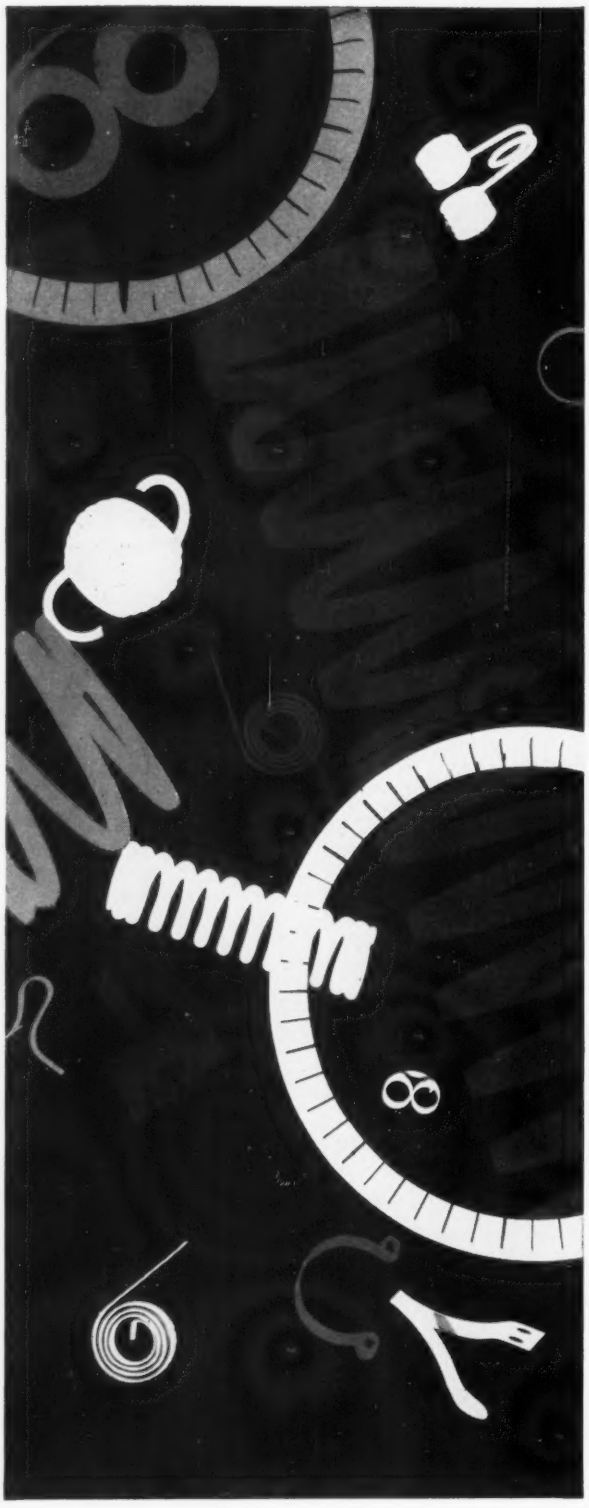

ARMCO STEEL

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Mr. Reuther Has a Point

For a long time we have disagreed with Walter P. Reuther on many things, including his methods for forcing the auto industry to come to terms and his plan of sharing the wealth of labor, management, and stockholders.

But in a face-to-face contact with the UAW president a few days ago, we found that we are in agreement on this:

Management and labor should meet at frequent intervals (in the absence of the bargaining table) to discuss and control problems.

Mr. Reuther says that the bargaining table does not provide a good climate in which to discuss economic and social problems objectively.

He also says that management is more willing to join in subjective discussions. This may be so in general, but we find at least one top management man in agreement with him.

President Mark W. Cresap of Westinghouse thinks that a great deal can be accomplished if union leaders and managers will get together around the dinner table, as well as around the negotiating table.

Such gatherings, he thinks, should be geared to limited objectives without any grandiose ideas about settling burning issues or solving differences between management and labor. But both would become more intelligently informed and be able to do a more constructive job of dealing with their mutual problems.

The contacts also would have tremendous value, we think, in wearing down useless suspicions and providing a better basis for discussing issues on their merits rather than from an emotional bias.

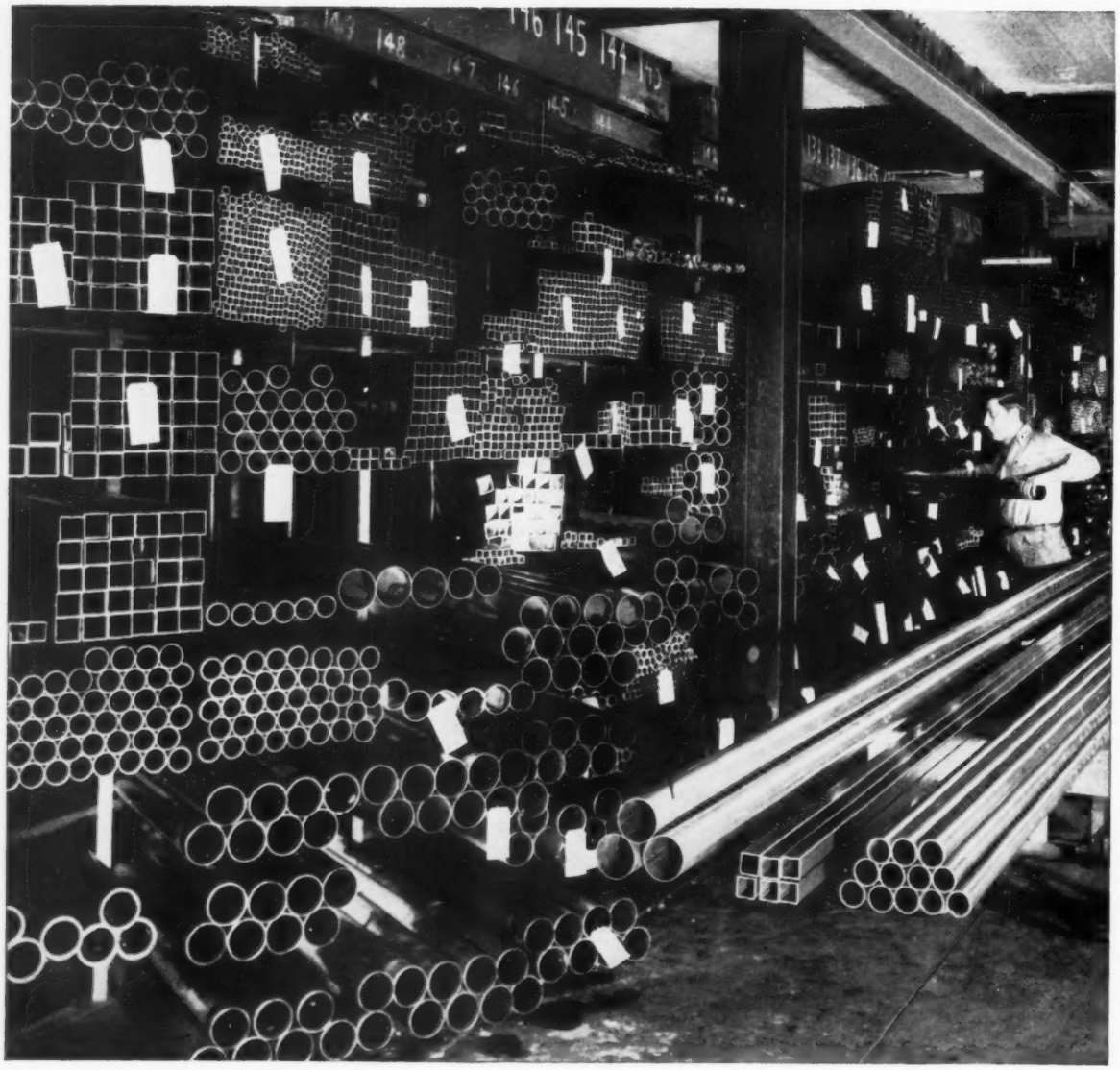
There are many complex problems arising from our growing economy and advancing technology that should be settled by free management and free labor on their own, without the benevolent guidance or interference of government.

We think that the objective approach for their solution suggested by Mr. Reuther and Mr. Cresap makes sense.

We think this approach should be applied on an industry basis and at the company and plant level.

Labor and management can resolve many of their differences simply by getting together and understanding each other better.

Irwin H. Such
EDITOR-IN-CHIEF



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What Auto Settlements Will Mean

- **Auto prices will increase even though economists term the pact noninflationary.**
- **Supplementary Unemployment Benefits are likely to become standard union demands.**
- **Cost of living escalation will be taken more for granted by workers, and management will have a rougher time keeping it out of contracts.**
- **Steel companies will be harder for the USW to bulldoze.**
- **Dave McDonald may become less stringent in USW demands (what he'll settle for, not what he'll ask for originally).**
- **Auto companies moved a step closer to industry-wide bargaining.**

Auto Pacts Set New Economic Trends

Remaining contract snags are mostly on special and local issues or in noneconomic areas. The money side has been pretty well set by the Ford agreement

LABOR SETTLEMENTS in the automotive industry could well signal the unleashing of the new boom. Some experts predict: 5.5 million new cars will be sold during the 1959 model year and 5.5 million will be built during calendar 1959.

Guaranteed three-year peace between autodom and the UAW will have some obvious results on the economy: Steel output will zoom; thousands of Detroit autoworkers will be rehired as will workers in auto supply firms all around the country; aluminum, rubber, glass, and textiles will feel a surge in demand. New car sales will be considerably better than they were this year—economists feel customers are regaining confidence.

But there are other, more subtle things to consider.

Inflationary? — Ford's settlement has been lauded as the "least inflationary since World War II."

And so it is. Judged from one direction, the Ford settlement added only about 5 to 6 cents an hour to what the company would have paid under an extension of the old contract. Cost of living and annual improvement factors were extended. Severance pay and the longer SUB coverage can be largely financed through existing SUB funds.

The estimated 5 to 6 cents is the approximate cost of new benefits (such as pension increases and pay boosts for skilled workers).

Even though economists (some of them at least) are applauding the contract as noninflationary, Joe Citizen will still find cars have jumped $30 to $60 in price on the high volume lines, even more on medium and low production models.

Effect on USW Demands—The United Steelworkers convention in Atlantic City, N. J., proved at least one thing: Dave McDonald has control, temporarily anyway. Rebel leaders fell flat on their collective faces in an effort to muster opposition to the union president.

Mr. McDonald won't have to gain much next year to be able to claim he did more for the USW than Mr. Reuther did for the UAW. He may be in more of a mood to aim for a favorable press by "fighting inflation."

But he's certainly not going to

be philanthropic. He is proud of his ability as a negotiator and the reputation he has gained with it. It's his best answer to any members' criticism, so he'll continue to be tough.

STEEL's prediction: Big steelworker demands in 1959, but the union will be ready to settle for a deal slightly better than the UAW won.

Other Trends—Management in firms completely divorced from the auto industry will do well to carefully study the Ford pact.

Cost of living escalation clauses are going to be harder to defeat in negotiations. They've been given reams of publicity, and workers not getting them are beginning to wonder why. Unions are apt to try to sneak it in by offering to forego wage increases.

Supplementary Unemployment Benefits got another boost toward becoming standard operating procedure. Employees are expecting it and talking about it. During union-management talks as contracts expire, workers are going to want SUB (or something similar in states where it's not allowed).

Management determined to avoid cost of living and SUB clauses may be forced into concessions larger than they can afford. Even so, the pattern set at Ford, particularly in SUB, is not cheap for firms without the auto company's large existing SUB fund.

Unity—The surprisingly strong front the three auto producers showed to Mr. Reuther is an indication that industrywide bargaining (like in the steel industry) is rapidly approaching for autodom.

Opens Used Lift Truck Lot

The Sales & Service Branch, Clark Equipment Co., New York City, has established what is believed to be the first national facility for dealing in used fork lift trucks.

Called the Used Equipment Center, it will buy, sell, or trade used fork trucks of any type or make. John Mitchell, general manager of the New York Branch, says the center will operate like a used car lot. It now has $250,000 worth of used equipment.

Do-it-yourself exhibits at 1958 exposition help make . . .

AISE Show Biggest Ever

FULL-SIZE DISPLAYS the visitor could operate dominated the exhibits at the Iron & Steel Show at Cleveland last week. Among the most popular were: A rolling mill pulpit, a punched card programming setup for a rolling mill, and a crane cab, complete with full-scale controls, which operated a model gantry crane.

Other attention - getters were working scale models of a bar and tube cooling rack, a cold reduction mill, and an automated annealing furnace.

High Point—Iron and steel executives were interested in all exhibits which showed the latest in automatic control and measuring devices for rolling mills and processing equipment, including blast furnaces and open hearths.

The rolling mill control systems shown by several exhibitors were popular.

Do It Yourself—General Electric Co.'s punched card programming system for rolling mills was typical. The visitor placed a punched card into a photocard reader, then stood back and watched the rolling mill mockup respond. A closed television circuit trained on the mockup gave the visitor an additional view and promoted the fine points of TV monitoring in an automated setup.

Shot cleaning equipment for rods and bars attracted much interest. Rod paid off one end of full-scale equipment passed through a leveler, then through the shot cleaning equipment.

As it came out, it was lubricated, reduced, and recoiled on the wire drawing machine.

Handling Needed—Material handling equipment got a big play. Displays of new types of fork lift trucks, and vibrator type conveying and mixing systems were well attended, as were the crane exhibits.

One fork lift featured a device (in the $2000 range) which replaces the standard forks with arms. When inserted in a coil, they can be extended to hold it fast. They can also be extended farther when unloaded and used as standard forks.

Aluminium Powers Up

Canadian producer of light metal is building 1 million hp powerplant 500 ft underground. To be completed in 1960, it will generate electricity for Quebec reduction plants

FIVE HUNDRED ft underground in what is said to be the oldest rock formation in the world, Aluminium Ltd., Canadian producer of aluminum, is building a powerplant rated at 1 million hp. Its cost: About $140 million.

This power project on the Peribonka River in Quebec will be completed in March, 1960. Two of its 200,000 hp, tubine-generator units will be operating next August. When finished, the new plant at Chutes-des-Passes (about 500 miles northeast of Montreal in Quebec's "bush" country) will raise the generating capacity of the Saguenay district to 3,580,000 hp. That's nearly equal to the capacity of powerplants supplying 11 U. S. cities — Cincinnati, Seattle, San Francisco, Dallas, St. Louis, New Orleans, Boston, Oklahoma City, Hartford, Conn., Washington, and Kansas City, Mo.

Hungry Potlines—The power is going mainly into the production of aluminum at Arvida and other nearby reduction plants. Two high tension lines (345,000 volts) will transmit the current 100 miles south to the Isle Maligne terminal station, then to the potlines.

The Chutes-des-Passes project is almost as big as the company's Kemano plant which supplies the Kitimat reduction plant in British Columbia. And it is similar in many of its construction features.

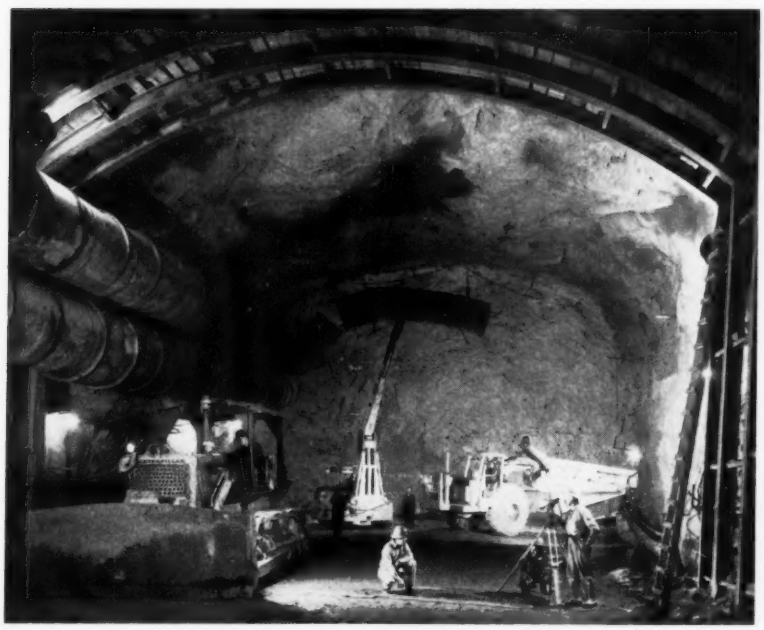
To obtain a greater head (total drop of water from source to turbines), a tunnel 34 ft in diameter is being blasted 6 miles through rock. Over 3 million cu yd of rock will be removed. The powerhouse itself is a chamber 465 x 70 x 70 ft. It is spanned by two, 210-ton overhead traveling cranes. Both the main tunnel and the powerhouse are concrete lined.

Uses Aluminum—Another tunnel, 2 miles long and 48 ft in diameter, is being drilled for discharge. Some 120,000 aluminum rock bolts have been driven into the walls.

The water source is a reservoir formed by the Passe Dangereuse Dam, built by Aluminium in 1945. It feeds through the main tunnel into five, steel-lined penstocks (14 ft in diameter) leading into the turbines. Aluminum bus bars will carry the power from the generators to a surface substation 500 ft above. An elevator shaft is being drilled through the rock to service the subterranean powerplant.

U. S. Interest—This project is important to the U. S. as well as to Canada because the U. S. is one of the biggest customers of Aluminium Ltd. From 1949 through 1957, U. S. purchases of Alcan aluminum jumped from 73,700 to 228,000 tons. (Aluminum Co. of Canada Ltd. is the producing subsidiary of Aluminium.) The Arvida plant alone can turn out 367,000 tons of ingots a year, which makes it the biggest smelter in the world, says Aluminium.

Including Kitimat, the company's capacity is 770,000 tons yearly, which makes it second only to Aluminum Co. of America. Although Alcan metal is sold throughout the world, one company official termed the U. S. the bread and butter market.



Surveyors check alignment at the junction of the main tunnel and an access tunnel drilled through solid rock at Aluminium Ltd.'s underground powerplant in Quebec

Unveils New Testing Units

ACCO Steel Casting Div. and R-P&C Valve Div., American Chain & Cable Co. Inc., Reading, Pa., have put their two newest units for nondestructive testing "on stream." "They will be able to inspect high pressure valves and castings at an accelerated rate—more than eight times faster than previous methods," says C. N. Johns, president.

The two units are a 2 million electron volt Van de Graaf radiographic x-ray generator and a 10 Curie source of cobalt 60.

Isotope radiography is not replacing high voltage x-ray equipment at American Chain. It is used when a grouping of castings of similar construction can be shot at once.

The new units provide American Chain with two universally accepted methods of spotting faulty castings, forgings, valves, and other assemblies before expensive machining and finishing operations.

Thirsty Metalworking

(Gallons of water used)

Per ton of steel	65,000
Per ton of explosives	200,000
Per ton of aluminum	32,000
Per ton of carbon black (furnace process)	140,000
Per ton of glycerin	1,100

Source: D. R. Woodward, Industrial College of the Armed Forces (1956-57).

Water Cost: Gushing

(Billions of 1954 dollars)

	1954	1957	1975
Waterworks (including source development, delivery, piping, and treatment)	17.1	20.0	38.8
Liquid waste disposal	4.8	7.2	18.2
Total	21.9	27.2	57.0

Figures (capital value, less depreciation and obsolescence) are for manufacturing and mineral industries.
Source: Water & Sewerage Industry & Utilities Div., BDSA.

Water, Water Everywhere?

Industry is finding out that answer is "No." Here's a report on what's being done to conserve resources. Bureau of Mines program may be most practical

BY 1980, the nation's needs for fresh water are expected to be three times what they are today. "Vast segments" of the population will be in jeopardy if water isn't available, concludes a Senate-House resolution.

Projections show: By 1980, industrial use will hit 390 billion gallons a day, a 400 per cent increase. Over-all demand is pegged at 597 billion gallons a day by the U. S. Geological Survey.

Possible Help—Some Washington officials are dreaming of pipelines from the oceans to interior America to supply industry with saltfree sea water, but the Bureau of Mines told STEEL of "a small, experimental program" in the Salt Lake City (Utah) area, which may be the beginning of new conservation methods.

With a small budget and three field workers, the bureau is studying ways to use subgrade water for metallurgical operations like flotation and leaching. The first step in the two-year-old, heretofore unpublicized project was to survey the water needs of plants in the area. The bureau reports the plants didn't know their own purity requirements: They merely used the best water they could get. "They assumed they needed pure water; they didn't need it at all," comments a bureau spokesman. When a full report is made later this year, there may be a new attack on the problem of setting water standards. "Many companies could use an inferior grade once they decide what water is supposed to do for them," this official points out.

Tailored Water—The three bureau workers are analyzing samples from drainage areas for mineral and hydrogen ion content. Flotation tests have been made in parallel (tap water, vs. river water) to see what differences occur in processing. In one case, they found that spring floods bring purer water. Plants could use such water at one time of the year, or they might even dam it up for year-round use. In flotation, the bureau finds that water hardness affects the process; common chemical softeners can correct that. Other ways of upgrading drainage water may also be found.

"We don't know what will come of this project," says the bureau spokesman, "but it's a start." Apparently, the feasibility of the work has been proved to the powers that be: If no budgetary problems develop next year, the bureau plans to move into the Missouri River basin for similar studies.

The bureau's approach seems to be both promising and practical in comparison with some plans. One expert, for example, would restrict food growing to the East where water is plentiful (agriculture consumes its water once and for all), and shift heavy industry to the West where water is short. (Industry can clean its water and re-use it.)

Growing Expense—Walter Picton, director, Water & Sewerage Industry & Utilities Div., Business & Defense Services Administration,

expects industry's water costs to more than double by 1975 (see chart). Today, between 9 and 11 per cent of the capital investment in a plant (excluding manufacturing equipment) is in water source development, delivery, treatment, and piping. The figure climbs to 20 per cent if you include waste disposal. Since water will have to be treated rather than dumped in the future, the cost ratio is certain to get even higher.

Evaporation Reduction—"Enough water is lost every year by evaporation in the 17 western states to supply all the country," reports the Interior Department. The Bureau of Reclamation has begun testing the use of hexadecanol as a "chemical shield" over Lake Hefner, Okla., to reduce evaporation. If it works, perhaps 15 to 20 per cent of evaporation losses can be prevented, and the predictions of Mr. Woodward (see table) might be mitigated in some areas.

Saline Water Program—Perhaps the most important advance in water conservation took place this year when Congress authorized Interior to spend $10 million on five experimental plants to convert salt water into drinking water. Some resistance to the program came from Interior and the Budget Bureau (because it was felt that more basic research is needed before plants are constructed), but Congress pushed ahead.

Definitive results probably won't be available for several years. But private industry is also at work: International Nickel Co. Inc. is studying several methods of converting sea water, and Westinghouse Electric International Co. reports completion of a giant plant in Kuwait, which is between Iraq and Saudi Arabia. The problem here is economics: Industry resists paying more than 10 cents per 1000 gallons now, says Mr. Picton; some estimates of sea water conversion run 30 to 40 cents (when Interior's program is finished). The Westinghouse plant's rate: 63 cents per 1000 gallons.

Joy Adds Line

Joy Mfg. Co., Pittsburgh, has formed a working agreement with Carpco Research & Engineering Inc., Jacksonville, Fla., to make and sell Carpco's High Tension Separator (a dry-process, electrical machine for iron ore beneficiating).

To handle the new equipment, Joy organized a mineral dressing department in its Mining and Construction Div. and appointed M. Bruce Mairs product manager.

Erecting Mill Stand

Republic Steel Corp. is installing a new, $1.3-million blooming mill stand at its Youngstown plant. The 2-high stand will be completed by Oct. 6, says J. H. Graft, Youngstown district manager.

Who'll Need Water in 1980

D. R. Woodward, staff engineer, U. S. Geological Survey, asserts: "We must take a second reading on how much water we need to use; industry must differentiate between its requirements and its preferences. We'll survive because we're adaptable, but we ought to anticipate the problem so we can avail ourselves of some of the alternatives. They include: 1. Use less. 2. Use conservation methods and pollution abatement so water can be re-used. 3. Transport water from places where supply is excess."

Mr. Woodward makes these projections for 1980:

1. **New England** will have an ample supply of water, even though gross use will nearly quadruple.

2. **The Delaware-Hudson area** may have to import water because gross use will almost triple.

3. **The Chesapeake** region may need additional storage facilities to insure adequate stocks.

4. **Around the Great Lakes,** supply will be satisfactory.

5. **In the Southeast,** large supplies will allow extensive industrial development.

6. **The Tennessee-Cumberland region** will have enough.

7. **On the Ohio River,** extensive re-use is already common, but much greater storage capacity will be needed.

8. **The Missouri-Hudson Bay and lower Mississippi areas** will have plenty.

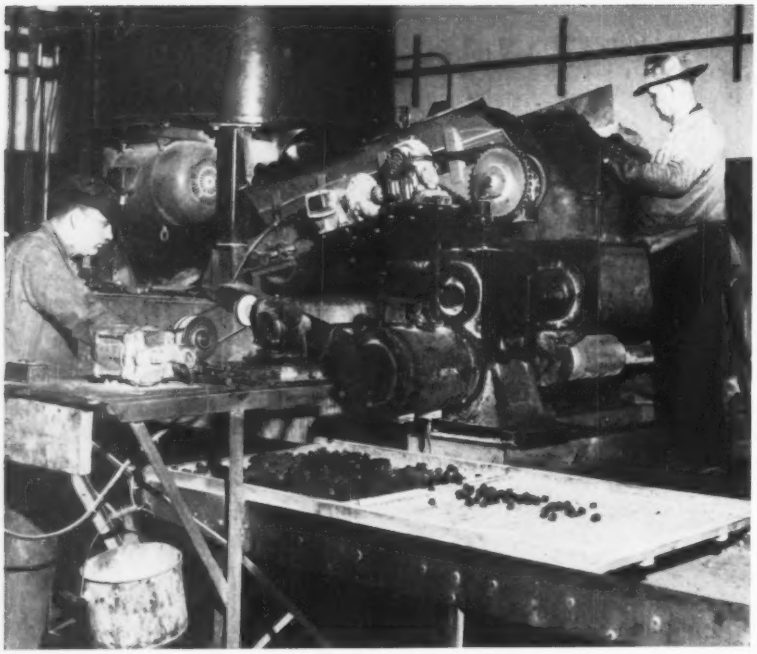
9. **In the Arkansas-White-Red area:** The western part will feel a shortage, while additional development will be possible in the eastern sector.

10. **In the Western Gulf-Rio Grande area:** The western part will be short of water.

11. **In the Colorado River and Great Basin areas:** Full scale development of resources will be completed; industrial needs will be met by converting water from irrigation use.

12. **The Pacific Northwest** will have ample supplies, except in the **Snake River basin.**

13. **Northern California's** excess will have to be transferred to **Southern California.** Water storage will be a major problem.



Briquetting of hafnium-free zirconium oxide for chlorination at Wah Chang

Zirconium Still Expanding

The metal's biggest market is in nuclear applications, but civilian uses may be found. Reserves are plentiful, and prices are coming down as demand steps up

ZIRCONIUM SPONGE production this year will climb to about 2.5 million lb, vs. some 1.7 million lb in 1957. During the last 12 months, U. S. capacity has jumped from 5.7 million to 7 million lb.

In addition to predicted U. S. production, about 300,000 lb will be imported from Japan. The Atomic Energy Commission has contracted for close to 3.6 million lb yearly.

Principal producers include: Carborundum Metals Co., Akron, N. Y.; Wah Chang Corp., Albany, Oreg.; Mallory-Sharon Metals Corp., Niles, Ohio, and Columbia-National Corp., Cambridge, Mass.

Applications—Applications center heavily in the nuclear field — the metal is used as a cladding and structural metal and an alloying constituent in reactors. It's also used in chemical corrosion resistant equipment, as an alloying element in steels (as a deoxidizer and getter for other contaminants), and for pyrotechnic applications (particularly in flashbulbs).

The physicals of the metal (high corrosion resistance, good mechanical properties, and a low neutron cross section) point to its potential in civilian power-producing applications.

The principal consumer is the U. S. Atomic Energy Commission. The Navy is the biggest single user (zirconium is employed extensively in the construction of U. S. atomic submarines).

Reserves—There need be no concern about running out of zirconium. U. S. reserves alone are greater than foreseeable demand for the next 100 years.

The metal is produced commercially in five countries: The U. S., Australia, Brazil, French West Africa, and India. Major U. S. mines are along Florida's eastern coast.

Price—The present market price is $7.50 per pound, but it's changing rapidly. Mallory-Sharon reports a price of $6 per pound for orders of at least 500 lb. The AEC contract price is $4.54 per pound, and one industry spokesman claims: "We could match that for the market price if capacity were being utilized 100 per cent."

Wah Chang estimates that the price will be $5.50 a pound in 1963, $4.50 in 1968.

Outlook — Production has been expanded from some 31,000 lb in 1950 to the estimated 2.5 million this year.

Pfaudler Co., Rochester, N. Y., predicts that use could expand more than 200 per cent in the next ten years.

The Bureau of Mines reports that no metal has been found that matches zirconium as a structural material in reactors. Nuclear energy expansion will undoubtedly increase the market for zirconium and probably for hafnium (which is always found with zirconium in nature).

Zirconium will probably replace tantalum in dental and surgical equipment, says a Bureau of Mines report. The report says zirconium is cheaper and at least as satisfactory in some equipment.

Some producers are even predicting that it will almost replace titanium.

Drawbacks—The cost of the pure metal must be reduced. Mining, transportation, and marketing costs compare favorably with those of other metals. Ore treatment is still more expensive.

Other problems include: Reactivity of zirconium with oxygen, nitrogen, and hydrogen. This dictates installation of welding equipment which can cover the material with inert gas during fabrication.

Builders Hit Escalation

Contractors want steel producers, particularly, to abandon the principle on fabricated work. Sorest point is government jobs that don't allow it on final bids

CONTRACTORS are boosting efforts to remedy an old grievance, the escalator clause in fabricated steel contracts.

Led by Associated General Contractors, they say they want no escalation whatsoever. But they would settle for no escalation on contracts where they themselves have to give firm prices to their customers.

Contractors' View—AGC's main targets are the basic steel producers who fabricate structural steel. The construction people claim the steel industry has the personnel and knowhow to predict prices even when the lead time is long, that it doesn't need the protection of escalation.

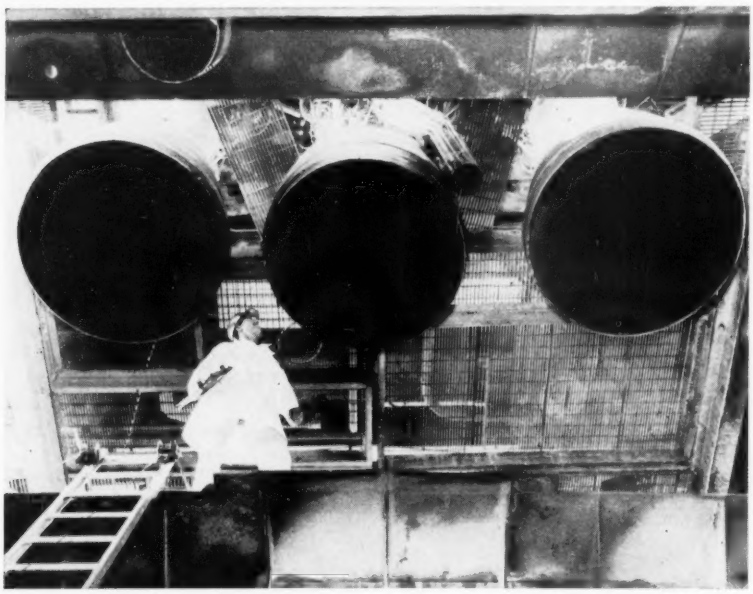
On much government work (now dominating many contractors' order books), a final contract containing an escalator is illegal, but the contractor may still have to take escalation on fabricated steel he needs.

Fabricators' View—Says one steel producer's fabricating department: "We don't like escalation any better than our customers do, but we haven't found anything better. In inflationary times like these, you have to protect yourself. But we do offer the contractor this protection: When he has to make a firm bid, we'll give him a ceiling on the escalation. Escalation works both ways. If our costs go down, we refund money. (Admittedly, there have been few such cases lately.)"

An independent fabricator points out: "If you don't handle inflation by escalation, you try to do it by covering what you guess inflation will be in your firm bid estimate. Escalation is a little more precise. In fact, some contractors don't mind escalation when they can get it on their bids. As a rule, we quote firm prices on short term work scheduled for delivery in 18 months or less. In escalator situations, we often agree to limit our escalation to 3, 4, or 5 per cent of the contract price if customers demand it."

Why the Drive Now?—AGC believes that the time is ripe to push against escalation because fabricated steel demand is off substantially for the first time since the end of World War II. In fact, during the slump some major steel producers have held escalation clauses to as little as $1 per ton of fabricated steel and have given their word that even that right would not be exercised. That compares with a time when steel was short and escalation ran as high as $40 per ton on deliveries to be made within 30 months.

The point is that the steel producers don't want to give up the principle of escalation on fabricated steel, no matter what business conditions are.



THIS CLUSTER OF ROCKET ENGINES is the most powerful in the Free World. Powering the Atlas ICBM missile, the group was developed by Rocketdyne Div., North American Aviation Inc. Rocketdyne began work on the system in 1954

Reed Roller To Expand

John F. Maher, new president of Reed Roller Bit Co., Houston, has announced a broad expansion and sales buildup program in which $25 million will be spent over the next five years. About $20 million is earmarked for the Houston plant. The expansion will be "over-all," from machine shop to research lab.

Mr. Maher indicated that an upswing is underway in oil equipment business. Reed's sales rose $353,000 in August.

Titanium Fasteners Gain

Annual use of titanium alloy fasteners in aircraft has jumped from 1 million in 1955 to an estimated 20 million, says the Air Materiel Command, USAF.

The increase, says AMC, is the result of a study-evaluation contract placed by its Manufacturing Methods Branch in 1955.

Forms Technology Dept.

Crucible Steel Co. of America, Pittsburgh, combined all its metal research, development, and metallurgical activities into a new Technology Dept. under the direction of M. J. Day, vice president. Of the company's research staff, 20 per cent are chemists and chemical engineers.

Singer Hums New Tune

THE STEP from sewing machines to missiles can be easier than you think, reports Singer Mfg. Co. In opening a Washington office "as a base of operations," the firm expects to meet the challenge of defense business with a three-point corporate setup, co-ordinated through a new Military Products Div., headed by Frederick Howells. Singer's three arms: 1. Its own manufacturing facilities at Bridgeport, Conn. 2. Diehl Mfg. Co., Somerville, N. J., for component development and production. 3. Haller, Raymond, & Brown Inc., State College, Pa., for research and development.

The company has long been in the industrial equipment business and has had plenty of experience with defensework during wartime. Now it plans to move into advanced weapon technology as fast as possible. "We want to become a formidable member of the nation's electronic team within five years," comments Noble Harris, Washington manager.

Research Is Open Sesame

With the acquisition of HRB, its research and development unit, this year, the company believes it will be able to meet the Pentagon's needs completely—even anticipate them. Singer is already working on the Regulus and is bidding on some important new projects. Eventually, it hopes for prime contracts with big production orders.

Mr. Harris points out that management has not given the new division a time limit on making a profit. But the firm will not cut bids to land a contract. Mr. Harris believes the Pentagon will respect Singer more if the bids are honest efforts to secure reasonable profits. "The effort to secure additional funds," says T. William Benedict, Singer military contract manager, "after you have bid too low, is bound to create trouble."

But Mr. Benedict admits that Singer will have to take the "stinkers" at first—the short runs and hard-to-do jobs—until its capability is well established.

Subcontracting Season's in Full Bloom

Singer should note this statement from J. L. Atwood, president, North American Aviation Inc., at an Electronic Industries Association meeting: "Within the next three or four months, North American will award more than 20 major system contracts involving electronics." Even though the company has plenty of experienced subcontractors already in its files, says Mr. Atwood, "we will accept bids from anyone."

Solar Furnace Starts Operation

Tomorrow (Sept. 30), our largest solar furnace begins work at Natick, Mass., says the Army. To be run by the Quartermaster Research & Engineering Command, it can generate up to 5000° F. The furnace will test materials for resistance to thermal effects of nuclear weapons.

The Army claims the unit can get "usable solar radiation" for most of a clear day.

Standardization and Cataloging

Says C. P. Milne, deputy assistant secretary of defense for supply & logistics: The Defense Department has completed the "phasing in" of the Federal Catalog System, which calls for every item in the Federal Supply System to have a single catalog number throughout the services.

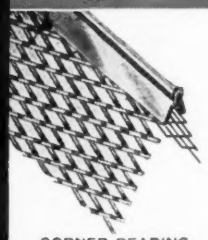
The 5 million items listed in 1952 (when Congress passed the law demanding the new system) have been reduced to 3.3 million items "and are being reduced further by standardization programs." The problem: 300,000 items enter the system each year—that's faster than the old ones can be taken out.

"Fantastic" results, says Mr. Milne, are coming from the standardization program. The Pentagon, for example, has been able to reduce the types of thermostats it uses to control the water temperature of engines from 350 to eight. Over 1000 kinds of cutting oils and greases have been cut to 525. One type of 18 ampere-hour automotive generator is now used in place of 151 models, reducing repair parts from 2260 to 16.

Basic Research Remains Neglected

Concludes the Research & Development Subcommittee of the Joint Atomic Energy Committee: 1. Atomic Energy Commission funds for basic research must be increased 50 to 150 per cent. 2. Worthy research projects must be "pressed forward vigorously," not entangled with the necessity for constant rejustification to the Budget Bureau. 3. A well-balanced program must be developed for all three major research areas: Chemistry, metallurgy, and physics. 4. The Sherwood (thermonuclear) project should be directed by an outside group of scientists, not by representatives of the laboratories participating in the program. 5. More backup research on Sherwood should be turned over to private industry and universities and more information about it should be declassified.

The Shapes of Things to Come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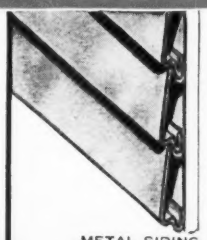
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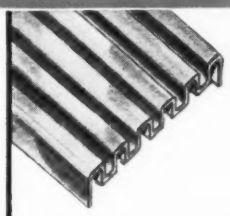
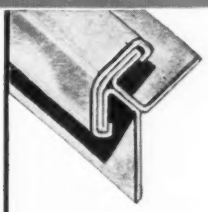
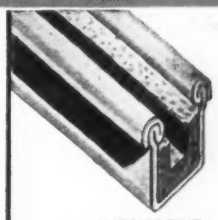

METAL DECK—FLUTING


STAINLESS—GALVANIZED TRIM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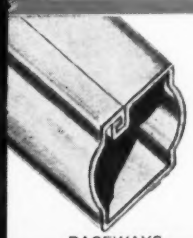
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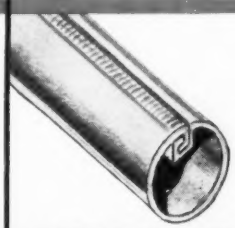
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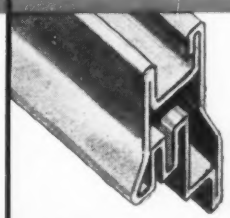
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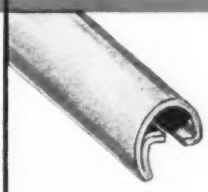
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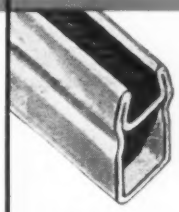
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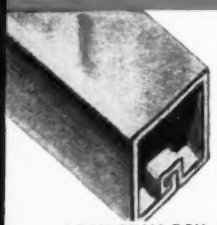
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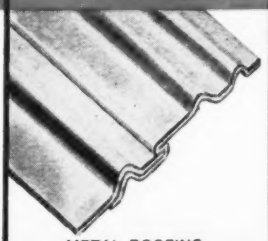
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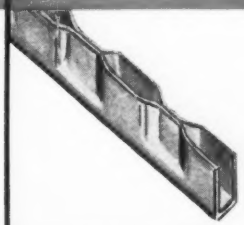
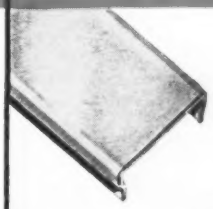

IRREGULAR PATTERNS

COATED METAL PRICE STRIPS


SHEET and STRIP FLANGING

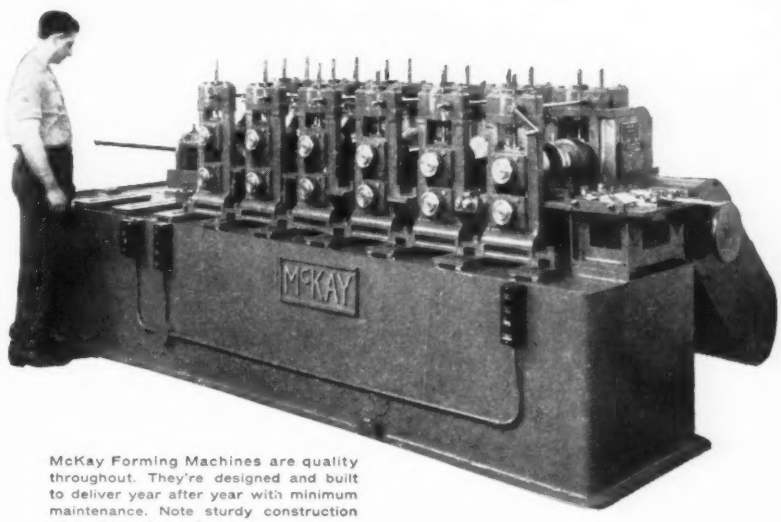
Call for McKAY FORMING MACHINERY

Two words that best describe McKay Forming Machines are "precision" and "ruggedness."

McKay Forming Machines are the last word in quality. They're designed and built to perform with extreme accuracy year after year. McKay users the world over know that quality is never sacrificed, even in the smallest details, for the sake of marketing a "cheaper" unit.

And McKay Forming Machines are built to customers' requirements with an eye to the future. They're machines that will not only meet today's needs, but machines that are ready for the faster speeds, tougher metals and more intricate shapes of tomorrow.

Be sure you have checked with McKay before you order forming equipment. You'll find this unmatched precision and ruggedness pays off in better forming at greatly reduced costs. And with a McKay—you're ready for tomorrow!



McKay Forming Machines are quality throughout. They're designed and built to deliver year after year with minimum maintenance. Note sturdy construction of machine pictured above.

The McKAY MACHINE Company
YOUNGSTOWN, OHIO

McK

ENGINEERS AND DESIGNERS OF EQUIPMENT FOR THE AUTOMOTIVE, FABRICATING AND STEEL INDUSTRIES

Charging some of the first T-ingots to arrive in the U.S. Photographed at an independent aluminum fabricator—the Kawneer Company, St. Charles, Illinois

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As specialists in the production of high-quality aluminum ingot in almost every shape and form, Aluminium Limited research is constantly seeking ways to improve its ingot products to serve its customers better. Whether your ingot problem is a question of shape . . . dimensional tolerances . . . or alloy composition control, Aluminium Limited's engineers have the know-how to help meet your ingot fabricating or aluminum remelt requirements.

The T-ingot design is one of several recent developments that have brought savings to many customers in the U.S. Available in 750- and 1500-pound sizes, and shaped like a flattened T, these ingots have been specially tailored to speed handling by fork-lift trucks . . . have successfully reduced railcar unloading time up to 50%. Precision formed, T-ingots stack compactly, up to 10 high, with greatly improved stability. For information about the T-ingot or aluminum in any other ingot form, call or write the nearest office of Aluminium Limited Sales, Inc.

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Charles Batchelder & Company, Botsford, Conn.

WORK SIMPLIFICATION

"WE MUST convince people that we want them to work smarter, not harder," says Allan H. Mogensen, director, Work Simplification Conferences, Lake Placid, N. Y., and Sea Island, Ga. He says that requires training them in some of the tools of management. The best way to get results from workers is not to tell them or sell them, but to consult them, he contends.

To Boost Productivity, Consult Your Employees

THE BEST CONSULTANTS you can hire may already be on your payroll. That's what several hundred companies found when they set up work simplification programs.

What WS Is—Work simplification makes the employee responsible for, and capable of, policing the efficiency of his own job. His goal is to reduce the operation to its simplest, easiest, and least costly form. Example: Wilfrid Thome, a repairworker at Cleveland Electric Illuminating Co., formerly cleaned the insides of porcelain cutout boxes by hand with a wire brush. He designed a brush to attach to a power drill—making the job easier, faster, and safer.

A broad philosophy (not a packaged scheme) based on employee participation, WS is used to ferret out and eliminate waste—of men, machines, materials, money, space, effort. It's effective: A $1000 savings from a $50 investment is no rarity. W. A. Hoffman, Radio Corp. of America's work simplification administrator, says the basis of WS is that the expert on any job, regardless of position, is the man who does it.

When It's Needed—When rising costs can't be passed on, higher efficiency is imperative for respectable profits. Work simplification boosts efficiency by upgrading employee productivity. That's because employees are taught to work smarter, not harder. So the plan meets with union approval.

Many companies didn't need "crash" cost reduction programs when the recession hit: They just pushed WS a little harder.

Take the case of CEI. Instead of burning nocturnal kilowatts probing for ways to lower costs, its management simply stepped up promotion of WS (CEI calls it Operations Improvement). Result: Savings of $884,000 during 1958's first seven months.

But WS does more than bolster your cost-cutting program: It can completely change employee attitudes. Cardinal rule in WS: Anyone who must deal with a new method participates in its development. The man who helps make a change will seldom resist it; nor will he fall back into his old unproductive rut.

How WS Works—Suppose a supervisor wants to improve material flow through several operations. His WS team might include his assistant foreman, an industrial engineer, all the workers involved, and himself. The team will make a flow process chart, man-machine charts if necessary, and perhaps brainstorm the process. By calling on each man's intimate knowledge of his job, bottlenecks and causes of waste are spotted. The team is free to call for staff help. The result is not only an improved operation but contagious enthusiasm on the part of the workers. Someone has listened to their ideas—and implemented them.

How You Get WS—Before an employee can participate in WS, he should know the philosophy behind it, its objectives, and how to go about it. So you give him a formal training program. Most companies start by sending upper management people to Allan H. Mogensen's Work Simplification Conferences.

After WS has been explained to upper management, including the president, the next step is to set up a 30 to 40 hour course for supervisors. B. F. Goodrich Co., Akron, kicks off its program with the "pegboard technique." The co-ordinator asks for a volunteer to put 30 pegs in 30 holes. Other trainees also perform. The co-ordinator asks them why they did it. That leads to discussion of the fastest, easiest way to put in the pegs. Then groups of trainees compete against one another. Finally, they dissolve into one problem-solving group.

The demonstration points up the fact that there's a better way to do even the simplest job. "An employee is used to following orders," says Glenn Cowan, Goodrich's co-

Cut One; Change Another

PROBLEM: At Whirlpool Corp.'s St. Joseph (Mich.) Div., imperfect welds resulted from oil on welder tips. Solving the problem by washing the parts caused a bottleneck at the washing machine. A work simplification team made a flow process chart and brainstormed the problem.

SOLUTION: Parts are air ejected from the punch press directly into an open tank filled with liquid cleaner. A conveyor takes washed parts from the tank and dumps them onto a skid (eliminating trucking and rehandling). Three hours of teamwork and $1550 for the tank and conveyor answered the need.

RESULTS: 1. Trucking and storage were eliminated. 2. Product quality was improved. 3. Waste was minimized. 4. Welding maintenance costs were cut. 5. The company saved $19,305 annually in labor costs alone. 6. Field repairs were reduced.

Simplify an Operation

PROBLEM: At Burroughs Corp.'s Detroit plant, a drill press operator drilled 74 holes into a part through a covered fixture in three operations. A quality control man checked the holes against a blueprint. Because it was such a long and tedious job, holes were frequently missed by both men. The error would be found during a later operation; the part would be sent back and the drill set up again. That wasted a lot of time.

SOLUTION: A five-man work simplification team (department supervisor, operators, quality control man) designed a plastic master plate for each drilling operation showing the correct number of holes in their proper position. When it is placed over the part, operators can tell at a glance whether all holes are right.

RESULTS: The new method is faster, more accurate, and easier; a $12 investment is saving Burroughs $1500 annually.

Eliminate an Operation

THE COMPANY—Potter & Brumfield Inc., a subsidiary of American Machine & Foundry Co., Princeton, Ind.

THE OLD METHOD—Masking compound was applied to all coil terminals prior to varnish impregnation (preventing the varnish from bonding to the terminal surface). After coils were baked, masking was cleaned from the terminals with a knife.

THE NEW METHOD—Mask and demask operations are eliminated by sending coils through impregnation bare. A centrifuge impregnating machine spins the varnish off the terminals leaving a suitable soldering surface.

SAVINGS—$14,766 annually in labor and material.

Find a Cheaper Method

THE COMPANY—Union Steel Products Co., Albion, Mich.

THE OLD METHOD—Sepia prints were made from a master when reproducing engineering drawings for hanger rods and custom built legs. The sepia was then marked up and prints run from it.

THE NEW METHOD—Drawings are put on Multilith masters. Vellums are run from the Multiliths and necessary information just filled in.

ADVANTAGES—1. Savings of $300 annually. 2. The print isn't folded or stamped. 3. Processing time is reduced. 4. Lettering can be typed on (the old method required hand lettering). 5. The new size takes less file space. 6. It costs less to mail the new size to fieldmen.

ordinator: "You have to let him know that he can be an innovator. Tell him about WS in other companies as well as your own. Let him know what the barriers to idea acceptance are and tell him how to overcome them. Show him how to communicate his ideas. Demonstrate management's active participation. Let him know that work simplification is 'the thing to do.'"

Trainees are shown how any operation can be reduced to simple steps; they learn to visualize an operation as: 1. Make ready. 2. Do. 3. Put away. They learn to use tools like the flow process chart, operator chart, and others. Liberal use of films, demonstrations, and examples put points across. Important: Show the trainee how he personally benefits from lower costs.

The Five Steps — Most plants teach their employees to follow Mr. Mogensen's five-step approach:

1. Pick a Job To Improve—Where are the trouble spots in your operation?

2. Get the Facts—They might include cost data, material lists, job descriptions, time studies, operation lists, blueprints, samples, specifications. Make a flow process chart (or use whatever tool best fits the job. Examples: Movies, mathematical models, still pictures).

3. Challenge Every Detail—Ask these questions: What is done? Why? Where? Why there? Where would be a better place? When is it done? Why then? Is there a better time? Or sequence? Who

does it? Why him? Can it better be combined with another's job? Does it have to be done at all? How is it done? Why that way?

Three Goodrich supervisors saved the company $8000 annually by challenging the sequence of assembly operations on a de-icer. By closing the inflation tubes on the end opposite to that closed previously, they saved $5.06 per unit in labor costs alone.

4. Find a Better Way—Step 3 naturally leads to new methods. The team or individual (although team effort is emphasized, one-man projects are common) then works out the proposed change and submits it to the boss (WS proposals are handled through the regular line organization) with a detailed list of advantages. Some firms provide a form for that.

5. Install the Improvement—But first find out: 1. Will the new method work? 2. Are the savings worthwhile? 3. Who is affected by the change? (Remember, they should help make it.)

Pushing the Program—The best way to sustain interest in WS, many advocates believe, is to keep a staffman out in the shop catalyzing, helping, advising, carrying ideas from one group to another.

Examples of CEI promotion methods: 1. Several supervisors jointly bought a "booby prize." Each month, the supervisor whose department installs the least improvements must claim the "booby" and display it on his desk for the next 30 days. Another group has a "Blinkey" routed monthly to the best of seven teams within the group. 2. Top management voices the need for ideas.

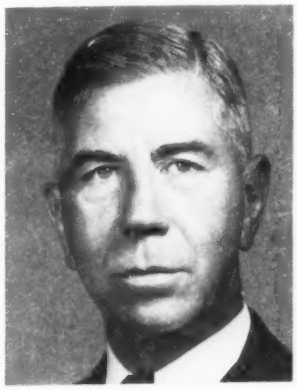
Necessary: Show participants the results of their efforts while they are current. CEI's group vice presidents check the number of dormant proposals monthly and instigate action on the older ones. Many companies give awards (usually not cash) for participation.

To Start New Projects—Seldom will an effective program get bogged down for lack of projects to tackle. But if it does, here are some ways to discover new jobs:

Use Work Sampling—Since it determines the proportions of time and money spent on each phase of an operation, it's a readymade indicator of where to direct your effort. "Another job for work sampling in your simplification program is to set supervisory objectives and appraise performance," says Wallace J. Richardson, associate professor of industrial engineering, Lehigh University, Bethlehem, Pa. "That's particularly true in indirect labor situations," he says. "For example, in a new system of tool control, how will you determine the potential savings and the realized savings? They're difficult to measure by conventional time study. Work sampling permits you to measure them directly." (STEEL will explore these and other uses of work sampling in a coming issue.)

Use Movies—A film of an operation replayed in after-hours quiet will often spark ideas. Some companies use movies to: 1. Present before and after methods. 2. Train employees in WS. 3. Let employees show their families how they helped improve an operation.

• An extra copy of this article is available until supply is exhausted. Write Editorial Service, STEEL, Penton Bldg., Cleveland 13, Ohio.



"The success of our work simplification program continues to amaze us. The volume of constructive ideas from our supervisors has grown every year at an astonishing rate. In the 14 years of our program, we've installed 316,691 work simplification improvements."

C. M. White, chairman, Republic Steel Corp.

"With the current 'big squeeze on business,' the ideas of every person in our organization are more important than ever before. Supervisors' ideas saved us more than $1 million in 1957."

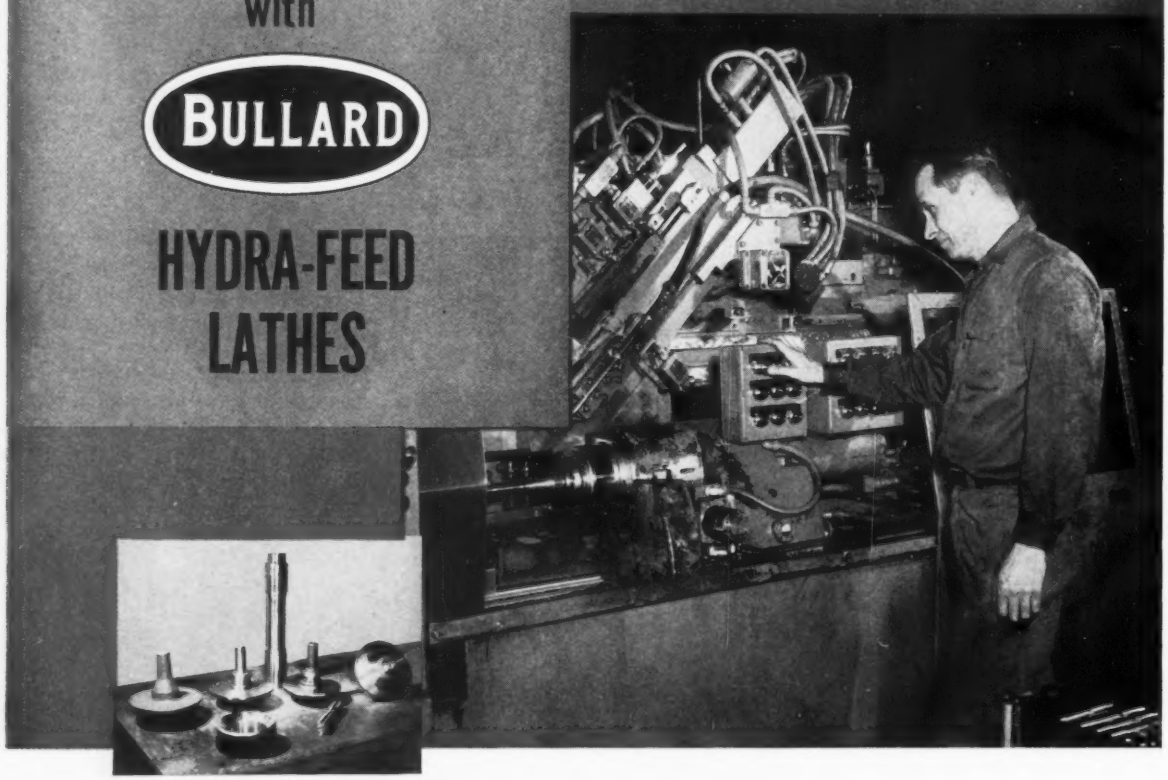
Fred Maytag II, president, Maytag Co.

"Our work simplification program is increasing productivity and reducing costs. We call it 'taking a new look at old jobs.' "

Carter L. Burgess, president, American Machine & Foundry Co.

INCREASE PROFITS by REDUCING COSTS with BULLARD HYDRA-FEED LATHES

The experience of The National Supply Company, Toledo, Ohio, manufacturers of oil field machinery, as related by Mr. Owen U. Trumbull, Tool Engineer, can be applied to improve your profit picture.



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- ★ Simplified tooling and set-up

These are all factors that have a direct bearing on profits

The BULLARD COMPANY

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Warranty Costs: Automakers' Headache

Defective parts in new cars cost them good will and good money. They are fighting back with better quality control, more careful styling, and interested workers

MENTION WARRANTY costs to any Detroit automan and he'll wince. In an industry where costs are figured to a split penny and quality is an industry prayer, nobody likes to admit having to add $40 to $120 to the price of their products to pay for defective and damaged parts. It hurts most when irate customers point out the goofs. As a result, automakers' efforts to reduce warranty costs have a direct effect on part design, material selection, and manufacturing processes.

Nobody wants to admit officially how much is allocated for warranty or what the biggest trouble areas are, but the story can be pieced together from conversations with industry executives.

What It's for—Warranty costs cover replacement of defective or damaged parts in the factory or in transit to dealers, replacement prior to dealer sale, and, naturally, replacement required by customers.

Exactly how much of a car's cost is tagged for warranty is secret, but higher volume producers like Ford and Chevrolet tack on about $40 to $45. The figure for medium priced lines is $70 to $80. The luxury lines have the highest allowance (up to $120) because volume is limited. Another factor: Dealers and producers are interested in keeping luxury car customers satisfied.

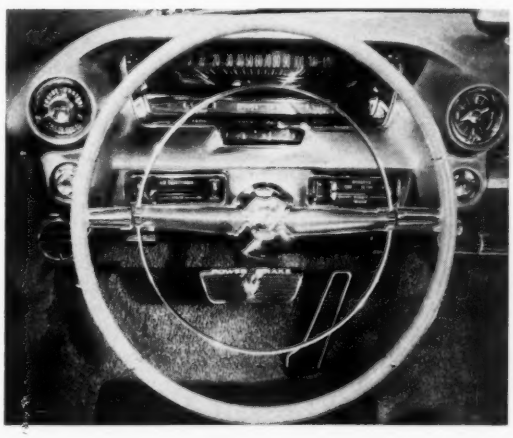
What Policy Means—Most manufacturers include a policy cost allowance in the warranty figure. It covers part replacement after the guarantee period. Most divisions will replace defective parts for a year after purchase if the customer pays dealer installation charges.

Major Trouble Items—The most common warranty problems involve engine parts, decorative trim, and tires. Radiators used to be an expensive headache until manufacturers started dropping pellets of sealing compound into them during assembly to stop minor leaks. It costs 3 to 4 cents a car, but it's saving the companies many dollars.

Quality Counts — "Look, you don't want to talk about warranty. Why don't you tell the readers about our good quality control," suggests one harried automotive executive. Quality control (or lack of it) is a chief factor in setting warranty allowances. A few years ago, for example, Ford was hit by an epidemic of defective radiators that boosted warranty costs to $1.20 per radiator during the winter. A big quality control drive in radiator welding and assembly cut the warranty cost to 8 cents per unit.

So Does Interest—Sloppy assembly also affects warranty costs. Rambler and Oldsmobile are reputed to have the best quality and the

GM Shows Instrument Panel Trends



Cadillac's 1959 instrument panel shows the new colors, shapes, and sizes that will be appearing on GM cars. AC Spark Plug Div., which will build more than 13 million instruments for GM cars next year, says the most noticeable trend is easier-to-read speedometers having bigger reflection hoods.

Instrument clusters will be in three basic styles: Straight line, circular, and fan or V- shapes. Printed circuits will be used by three divisions and are expected to be standard by 1960. Warning lights on gages and changing color speedometers are gaining favor slowly. AC engineers say needle indicators won't be replaced for some time.

Two other promising prospects are a transistorized speedometer and fuel gage showing speeds and fuel levels on vertical color bands.

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lowest warranty costs in the industry. (Next year's Rambler Rebel costs reportedly include only $37 for warranties.) American Motors Corp. says one reason for this is that the cars are built in smaller cities where workers take pride in their work.

Design's Vital, Too—Last minute trim changes and intricately designed brightwork often cause production problems resulting in poorly plated or corrosion prone parts. One of the Big Three switched to an aluminum parking lamp bezel in the middle of this year's model run. Reason: The part was exposed to so much corrosion that it cost too much to plate adequately.

So Are Methods—Next year, General Motors Corp. will increase the thickness of nickel on its plated trim. Several GM divisions will be using a Du Pont developed plating process on bumper guards, eliminating some handling and polishing steps by permitting level plating on rough metal. The parts have better rust protection because the thin copper plate is not buffed. Result: Reduced warranty costs.

Keep Trying—Auto industry suppliers should consider the warranty cost problem when suggesting manufacturing processes or materials. As Detroit betters quality control, the warranty level will drop.

U. S. Auto Output

Passenger Only

	1958	1957
January	489,357	642,090
February	392,112	571,098
March	357,049	578,826
April	316,503	549,239
May	349,474	531,365
June	337,355	500,271
July	321,053	495,628
August	180,313	524,354
8 Mo. Total	2,743,216	4,392,871
September		284,265
October		327,362
November		578,601
December		534,714
Total		6,117,814
Week Ended	1958	1957
Aug. 23	25,918	123,130
Aug. 30	16,771	118,553
Sept. 6	12,016	90,704
Sept. 13	24,072	85,816
Sept. 20	37,549†	52,365
Sept. 27	62,000*	51,528

Source: *Ward's Automotive Reports.*
†Preliminary. *Estimated by STEEL.

New Olds Is Longer, Lower

Oldsmobile's 1959 line offers 15 body styles (vs. 16 in 1958). One station wagon has been dropped. Holiday sedans and coupes are replaced by Holiday Scenicoupes and Sportsedans.

Wheelbases of the Dynamic and Super 88 series are 123 in., an increase of ½ in. Over-all length is increased from 208.2 to 218.4 in. The 98s are 7 in. longer with an over-all length of 223 in. Passengers have 1 in. more legroom in the two 88 series and 4 in. more in the 98 series.

Height ranges from 53.6 in. for the convertibles to 56 in. for the 4-door sedans. The Holiday Scenicoupe is 53.7 in. high, or 3.2 in. lower than the 1958. Trunk space has been increased up to 64 per cent, and there is 36 per cent more glass area in all models, including a windshield that's 570 sq in. larger. Backlights are impregnated with an iron oxide film that cuts heat passage 84 per cent and glare 78 per cent. Electric windshield wipers are standard.

Engines—Olds has lowered compression ratios on its two Rocket engines from 10:1 to 9.75:1 and increased displacement on the larger engine from 371 to 394 cu in.

Equipped with a 2-barrel carburetor, the Dynamic 88 is rated at 270 hp, up 5 over 1958. Torque remains 390 ft-lb. The Super 88 and 98 engines have 315 instead of 305 hp. Torque is 435 ft-lb, up 25. A redesigned 4-barrel carburetor is standard. The optional J-2 engine offered in 1958 has been dropped. Both new engines come with an automatic split choke for independent fast idle and mixture control, so fuel mixtures can be leaned out sooner in cold weather.

Frames are 9 in. wider and 10 in. longer, and suspension components are improved. New air scoop brakes feature an outer flange exposing 88 sq in. more area, which helps heat dissipation. Wheels are still 14 in.

The Hydra-Matic transmission has been made more efficient by increasing the vane pitch on the main fluid coupling 25 per cent. A new power steering unit, also to be offered on other GM cars, uses a rotary control valve requiring only 1 lb of pressure for normal driving and 2.5 lb under any conditions.

On the 98 series, the grille is extruded aluminum. The 88 series have a stamped aluminum grille. Some 15 colors with 81 different two-tone combinations are offered in GM's Magic Mirror, acrylic lacquer finish.

Oldsmobile's trans-portable radio has been redesigned for pushbutton tuning when in the car.

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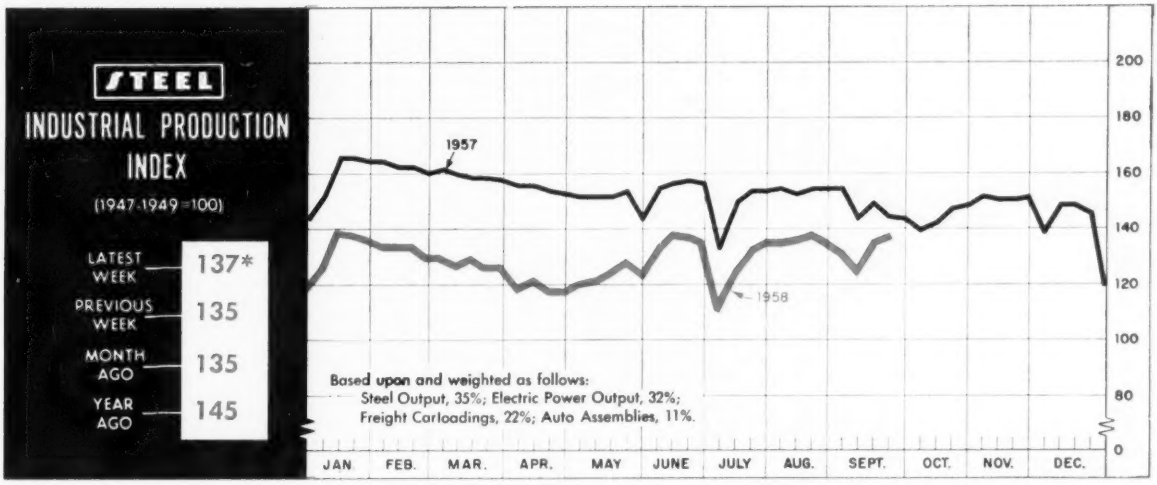

*Week ended Sept. 20.

New Highs Push Index Toward Peak

YOU MAY SEE STEEL's industrial production index hit a new high for the year in early October. Indications are that it will edge close to last year's levels. In the week ended Sept. 20, it climbed to 137 (1947-49=100). Better marks were posted in only five previous 1958 weeks; four were in the first half. Highest: 139.

Factors in Pickup—1. Revenue freight carloadings by U. S. railroads hit a new high for 1958 in the week ended Sept. 13. All categories of freight registered increases over the previous week, reports the Association of American Railroads, Washington. The new high: 665,999 cars. Coal loadings showed a gain of 19,588 cars; ore loadings rose 6258 cars.

2. Steel production for the week ended Sept. 27 is estimated at 1,793,000 tons by American Iron & Steel Institute. The highest weekly output recorded previously this year was 1,780,000 (in the week ended Sept. 13). Producers report order gains from nearly all major markets, indicating a sound base for recovery.

3. Electric energy distributed during the week ended Sept. 13 amounted to about 12.25 billion kw-hr. Though not a high for the year, that figure represents a 2.5 per cent gain over the like 1957 span, says Edison Electric Institute.

4. With model changeover completed by many car divisions, auto production is beginning to surge upward. Barring prolonged labor troubles, automakers can force STEEL's 1958 industrial production trendline to cross the 1957 line for the first time. Only 8 index points separate them now—despite production of less than 38,000 U. S. passenger cars during the week ended Sept. 20.

More Good Signs—Signaling the uptrend are rehirings, confident talk, and firm orders. Examples:

1. Allis-Chalmers Mfg. Co.'s Springfield (Ill.) Works recalled 1150 workers. Says A. C. Boock,

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Production (1000 net tons)[2]	1,793[1]	1,771	2,105
Electric Power Distributed (million kw-hr)	12,200[1]	12,248	11,991
Bituminous Coal Output (1000 tons)	8,400[1]	8,340	10,089
Crude Oil Production (daily avg—1000 bbl)	7,000[1]	7,009	6,840
Construction Volume (*ENR*—millions)	$332.4	$360.7	$328.7
Auto, Truck Output, U. S., Canada (*Ward's*)	54,509[1]	32,097	68,875
TRADE			
Freight Carloadings (1000 cars)	670[1]	666	725
Business Failures (Dun & Bradstreet)	256	191	237
Currency in Circulation (millions)[3]	$31,393	$31,433	$31,184
Dept. Store Sales (changes from year ago)[3]	+4%	+2%	0%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$23,953	$20,237	$23,981
Federal Gross Debt (billions)	$276.8	$278.3	$273.3
Bond Volume, NYSE (millions)	$32.3	$24.7	$17.5
Stocks Sales, NYSE (thousands of shares)	18,111	15,731	8,180
Loans and Investments (billions)[4]	$94.7	$94.3	$86.6
U. S. Govt. Obligations Held (billions)[4]	$32.7	$32.7	$24.8
PRICES			
STEEL's Finished Steel Price Index[5]	246.65	246.65	239.15
STEEL's Nonferrous Metal Price Index[6]	197.9	198.8	209.7
All Commodities[7]	119.0	119.0	117.9
Commodities Other than Farm & Foods[7]	126.0	126.1	125.8

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1958, 2,699,173; 1957, 2,559,490. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-39=100. [6]1936-39=100. [7]Bureau of Labor Statistics Index, 1947-49=100.

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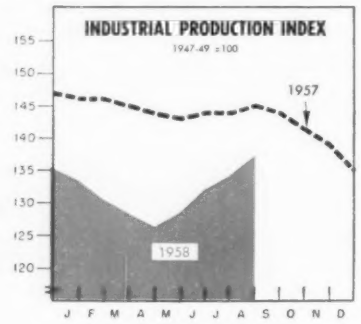
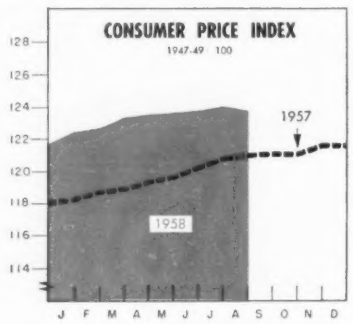




(Seasonally adjusted)

	Total Production		Primary Metals		Metal Fabricating	
	1958	1957	1958	1957	1958	1957
Jan.	133	146	100	143	159	180
Feb.	130	146	95	143	153	180
Mar.	128	145	91	137	150	179
Apr.	126	144	86	134	146	176
May	128	143	91	132	148	176
June	132	145	103	132	151	179
July	134	145	102	134	154	179
Aug.	137*	145	107*	136	156*	178
Sept.	...	144	...	131	...	174
Oct.	...	141	...	128	...	168
Nov.	...	139	...	121	...	170
Dec.	...	135	...	107	...	163
Avg	...	143	...	132	...	175

Federal Reserve Board. *Preliminary.
Charts copyright, 1958, STEEL.

	1958	1957	1956
Jan.	122.3	118.2	114.6
Feb.	122.6	118.7	114.6
Mar.	123.3	118.9	114.7
Apr.	123.5	119.3	114.9
May	123.6	119.6	115.4
June	123.7	120.2	116.2
July	123.9	120.8	117.0
Aug.	123.7	121.0	116.8
Sept.	....	121.1	117.1
Oct.	....	121.1	117.7
Nov.	....	121.6	117.8
Dec.	....	121.6	118.0

U. S. Bureau of Labor Statistics.

general manager: "There are indications that further boosts in production (and employment) may be warranted."

2. Aetna-Standard Engineering Co., with a $20 million backlog, has started working two shifts. Says Chairman E. E. Swartswelter: "I think in the next six months we are going to have an awful lot of business."

3. Westinghouse Electric Corp. will call back 250 furloughed employees at its Mansfield, Ohio, plant. The move reflects a general pickup in sales of automatic laundry equipment, ranges, and small appliances, states Dean B. Fighter, works manager.

4. Avery C. Adams, president, Jones & Laughlin Steel Corp., predicted a production comeback sufficient to cover the firm's dividend requirements for the year unless further labor troubles develop in the auto industry. Mr. Adams said he believes inventory reduction has bottomed out and business should improve in October and November.

5. From the barometric steel strapping industry comes this report: Signode Steel Strapping Co. says its sales have reached the halfway point between the record high of January, 1957, and the low point in February, 1958. August shipments ran 20 per cent ahead of those in the year-earlier month.

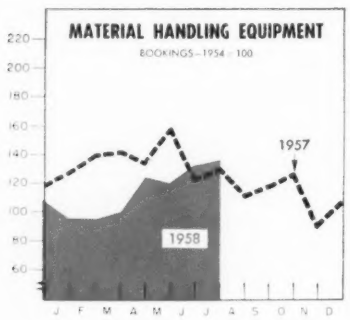
Consumer Prices Drop

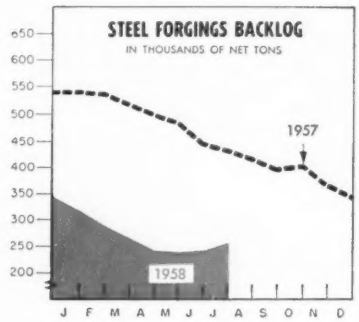
Last month, consumer prices fell for the first time in two years. The Bureau of Labor Statistics reports its index ebbed 0.2 per cent to 123.7 (1947-49 = 100). Seasonal cuts in prices of fresh fruits and vegetables were largely responsible. Ewan Clague, commissioner of labor statistics, forecasts a generally steady price level for at least the next few months. The drop means a slight increase in buying power for the average factory worker.

Construction Still Strong

Heavy construction awards totaled $332.4 million in the week ended Sept. 18, reports *Engineering News-Record*. That pushes the total for 1958's first 38 weeks above the $4.7 billion mark—a 7 per cent improvement over the like 1957 period.

Sparked by a healthy $107.7 million in highway awards, public contracts totaled $223.3 million. Highway construction is now increasing faster than any other type of pub-





	1958	1957	1956	1955
Jan. ...	93.07	126.34	122.43	97.00
Feb. ...	93.49	139.29	129.56	98.71
Mar. ...	97.89	140.76	166.14	149.16
Apr. ...	122.36	132.67	145.20	109.52
May ...	118.04	157.95	155.53	110.50
June ...	131.15	121.57	189.13	139.00
July ...	134.34	128.31	165.50	111.76
Aug. ...	.....	110.09	168.70	106.20
Sept. ...	.....	116.79	130.35	136.80
Oct. ...	.....	124.80	143.38	123.52
Nov. ...	.....	87.80	138.50	118.09
Dec. ...	.....	105.65	117.76	139.85
Avg ...	.....	124.34	147.68	120.01

Material Handling Institute Inc.

	Shipments		Unfilled Orders	
	1958	1957	1958	1957
Jan. ...	108	148	318	537
Feb. ...	93	135	288	533
Mar. ...	92	146	266	517
Apr. ...	83	139	242	497
May ...	78	135	240	479
June ...	87	128	242	445
July ...	68	104	257	431
Aug.		115	...	417
Sept.		117	...	397
Oct.		126	...	401
Nov.		105	...	365
Dec.		99	...	343

U. S. Bureau of the Census. Data based on reports from commercial and captive forge shops with monthly shipments of 50 tons or more.

lic work. Also strong are waterworks ($5.7 million for the week) and "unclassified" public contracts ($27.5 million). Contracts for all other types of public construction dropped from the previous week.

Private construction is still relatively low. "If there is a need for improved or larger facilities, it would be wise to build soon," H. C. Turner Jr., president, Turner Construction Co., told the National Industrial Conference Board. His reason: Building costs will climb. Severe competition and less industrial expansion have pushed costs below the level of one and two years ago, says Mr. Turner. But they're 40 per cent higher than they were ten years ago. "If the consumer price index rises 2 to 3 per cent per year due to general wage increases, construction costs will probably go up 3 to 5 per cent per year," he contends.

GNP May Pass 1957 Peak

Gross national product, now running at an annual rate of more than $435 billion, may pass the 1957 peak of $445 billion late this year or early in 1959, predicts John D. Wilson, vice president, Chase Manhattan Bank. GNP rose to $429 billion at mid-year—$3.2 billion ahead of its rate at the end of the first quarter.

The National Industrial Conference Board estimates that GNP has risen about $10 billion during the current quarter. That's almost as fast as the rate of increase during the booming recovery in late 1954 and early 1955.

Sales of soft goods are sharply above the second quarter pace; outlays for consumer durables are slightly higher; service outlays have continued to rise.

Machine Tool Orders Mixed

While new orders for metal cutting machine tools dropped last month, orders for metal forming types rose sharply. Net new orders for the metal cutting variety totaled $18.95 million in August (vs. $20.9 million in July), says a preliminary report by the National Machine Tool Builders' Association. Net new orders for metal forming types rose to $9.1 million in August, vs. $5.65 million in July, under the impetus of $2.4 million worth of foreign orders, the preliminary report shows. That means a net gain of $1.5 million in August over July.

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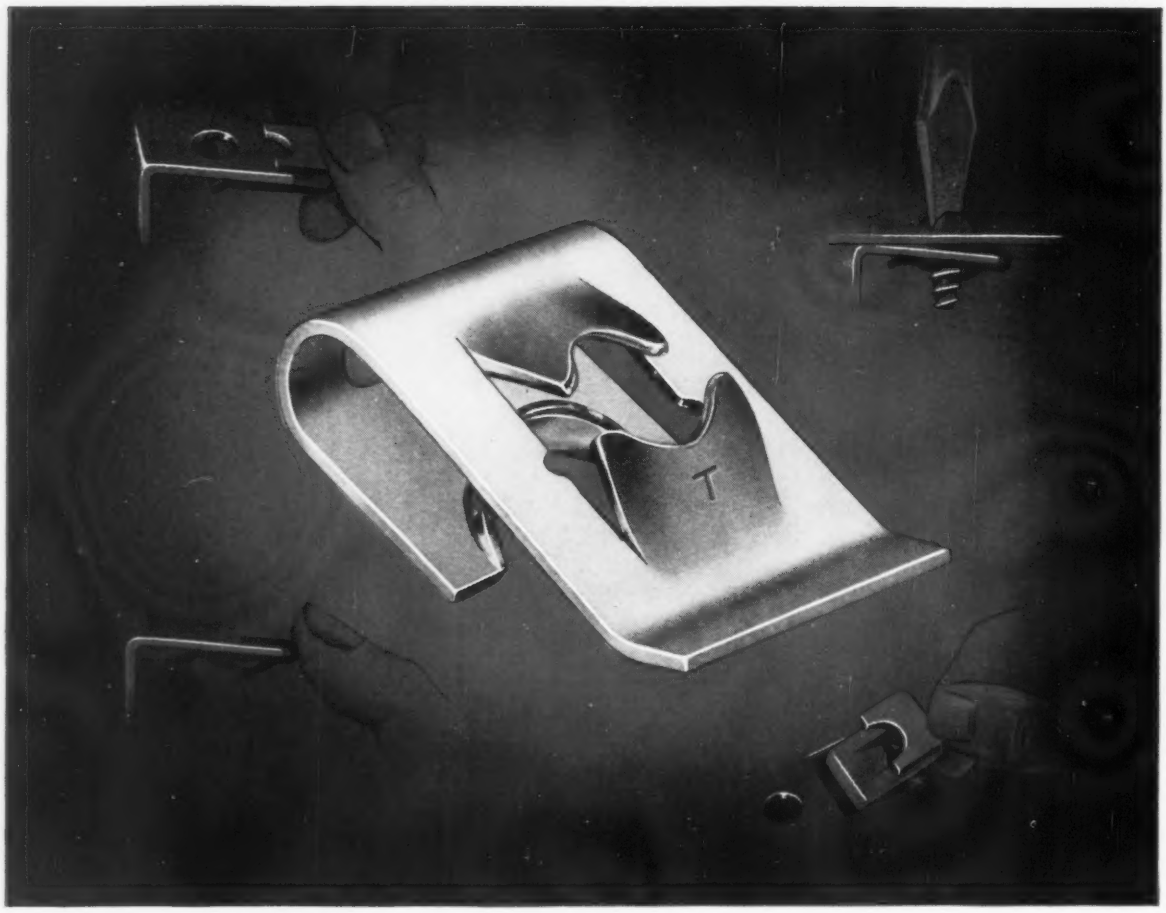

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Vulcan Mold & Iron post

DR. HAMNETT P. MUNGER
heads Republic Research Center

PHILLIP C. VETTER
Great Lakes Steel v. p.

RALPH L. JAESCHKE
Eaton div. chief eng.

G. Gordon Mead was appointed chief industrial engineer; **Donald G. Hazlett,** product engineer of **Vulcan Mold & Iron Co.,** Latrobe, Pa. Their responsibilities cover operations at both the Latrobe plant and its Chicago district plant at Lansing, Ill.

Dr. Hamnett P. Munger was named head of the metallurgical division of **Republic Steel Corp.'s** new research center in Independence, Ohio. He was chairman of the department of chemical and metallurgical engineering at Syracuse University.

Harold Y. Hunsicker, assistant chief of the Cleveland division of **Alcoa Research Laboratories,** Aluminum Co. of America, was promoted to chief of the physical metallurgy division of the company's research organization. He is in New Kensington, Pa. **Dr. William L. Fink,** former chief, physical metallurgy division, was promoted to the new post of scientific co-ordinator for ARL, effective Oct. 1.

Frank Ross was elected vice president-sales, **E. F. Houghton & Co.,** Philadelphia. He succeeds **David J. Richards,** retired. **Charles R. Schmitt** was made assistant to vice president-sales.

Torrington Co. appointed **E. G. Rowlett** manager of the Los Angeles office to replace **J. H. Williams,** who became assistant to the sales manager, Bantam Bearings Div., South Bend, Ind. **John Heyvaert** replaces Mr. Rowlett as district engineer in Davenport, Iowa.

Phillip C. Vetter was appointed vice president-engineering, **Great Lakes Steel Corp.,** Ecorse, Mich., division of National Steel Corp. Former chief engineer, he succeeds **D. E. McGuire,** retired.

E. L. Spencer, chief executive at **Fairmount Tool & Forging Inc.,** Cleveland, since its acquisition by Houdaille Industries Inc. in 1955, was named general sales manager of Houdaille's Buffalo Hydraulics Div., Buffalo. **A. J. Fratianne,** factory manager at Fairmount, was made its general manager.

A. V. Zukas was appointed vice president, **Parker Aircraft Co.,** subsidiary of Parker-Hannifin Corp., Cleveland. He is responsible for contract administration and product planning for the Los Angeles, Inglewood, and Cleveland operations. He was general sales manager in Los Angeles.

R. C. Hitchcock, former director of purchasing at **Line Material Industries,** was named manager of its central plant at South Milwaukee. He replaces **A. E. Perlman.**

Edward L. Kuhn was elected president and general manager, **Consolidated Packaging Machinery Corp.,** Buffalo. He succeeds his father, **Edward G. Kuhn,** retired.

Arthur J. Raymo was appointed factory manager, Eddystone, Pa., Div., **Baldwin-Lima-Hamilton Corp.** He was consulting manufacturing engineer for General Electric Co. at its atomic power equipment department, San Jose, Calif.

Ralph L. Jaeschke was appointed chief engineer, Dynamatic Div., **Eaton Mfg. Co.,** at Kenosha, Wis. He succeeds **W. F. King,** who is retiring due to ill health. He will be a consultant on engineering matters. Mr. Jaeschke retains his position as manager of research and development.

John P. Strand was named division superintendent-titanium at **Crucible Steel Co. of America's** Midland, Pa., Works. He was superintendent of operations, titanium division.

William I. Dieters was appointed process control manager, **Precision Castparts Corp.,** Portland, Oreg. He was formerly with Fabricast Div., General Motors Corp., and with Misco Precision Casting Co.

John B. Beckwith was named to the new post of engineering manager; and **David E. Waite,** former chief product engineer, was assigned to the factory manager's staff on special assignments for **Wallace Barnes Div.,** Associated Spring Corp., Bristol, Conn.

G. W. Jones was appointed manager of market research at **Riverside-Alloy Metal Div.,** H. K. Porter Company Inc., Riverside, N. J.

Kenneth P. Coan was made assistant manager, chain and transmission division, **Chain Belt Co.,** Milwaukee. **Bruce Dedlow** was made export sales manager. Both appointments are effective Nov. 1.

Rene A. Vanina was made assistant division sales manager, **Electro Dy-**

HOWARD C. BEYER
Jeta Metal Fabricators post

EDGAR W. ENGLE
Kennametal mineral prod. mgr.

JOSEPH P. OSSOLA
Granite City Steel prod. mgr.

GRAHAM B. BROWN
Mallory-Sharon Metals v. p.

namic Div., Bayonne, N. J., General Dynamics Corp.

Howard C. Beyer was promoted to general manager for all divisions of **Jeta Metal Fabricators Inc.**, Yonkers, N. Y. He was general manager, power equipment division.

Edgar W. Engle was named manager of mineral industry products, **Kennametal Inc.**, Latrobe, Pa. Now in charge of the mining tool division at Bedford, Pa., he will also guide development of wider markets for the company's hard carbide products in mining and associated mineral industries. He is at Latrobe. **Edwin H. Johnson**, former mining division manager, was made a consultant in the development and marketing of new products in the mineral industries field.

E. Roy Grant was elected vice president and manager, Rocky Mountain Div., **Armco Drainage & Metal Products Inc.**, Middletown, Ohio, subsidiary of Armco Steel Corp.

Alvin R. Ziv joined the sales department of the Detroit branch of **Ziv Steel & Wire Co.**

George Pekrol was appointed factory manager of **Dollin Corp.**, Irvington, N. J. He has been chief estimator.

Frank W. Schreiner was named Cleveland district office manager, **Pratt & Whitney Co.**, West Hartford, Conn. He succeeds **Frank W. Harrison. Arthur C. Dade** was named cutting tool and gage sales manager for the Cleveland territory.

Joseph P. Ossola, assistant production manager, was promoted to production manager of **Granite City Steel Co.**, Granite City, Ill. He succeeds **Harry C. Emrie.**

George F. Clifford was made acting manager, **Spinco Div.**, Beckman Instruments Inc., Palo Alto, Calif. **Dr. Edward G. Pickels**, cofounder of Specialized Instruments Corp., which became the Spinco Div. of Beckman, was acting temporarily as manager. He resumes full-time duties as director of research and development for the division.

I. D. Orvis was promoted to the new post of general manager of **Dynex Inc.**, Milwaukee.

Kenneth C. Schlegel, general sales manager, was elected president of **Schlegel Mfg. Co.**, Rochester, N. Y. He succeeds his father, **Carl F. Schlegel**, now vice chairman.

Ohio branch managers for **Carpenter Steel Co.** are: **Donald F. Ross**, Dayton; **Harry L. High Jr.**, Cincinnati.

Kermit L. Johannsen replaced **E. B. Speer** as general superintendent, **Fairless Works**, U. S. Steel Corp., Fairless Hills, Pa.

Earl L. Wilson Jr. was made manager of the eastern district for the metal products division, **Koppers Co. Inc.** He is in New York. Mr. Wilson was sales manager of Koppers Box Machinery Dept. at Glenarm, Md.

C. K. Taylor was made Michigan representative of **Acme Chain Corp.** He has headquarters in the Fisher Bldg., Detroit.

Graham B. Brown was made vice president of **Mallory-Sharon Metals Corp.**, Niles, Ohio. He was director of marketing. In his new post, Mr. Brown will have over-all supervision of market planning and sales policy for the company's reactive metal raw materials and mill shapes. He will also direct the field task force and will handle general administrative duties.

William H. Armstrong was elected vice president and general manager, **Metal Finish Inc.**, Newark, N. J., U. S. sales agent for the recently developed Vibraslide barrel finishing machine and manufacturer of other metal finishing equipment and accessories.

John R. Burwell was appointed manager of government sales for **Olin Aluminum Div.**, Olin Mathieson Chemical Corp., New York.

Jack H. McWilliams was appointed manager of ore exploration for the mining division of **Aluminum Co. of America.**

E. F. March was appointed to the new post of vice president-finance, **Midland-Ross Corp.**, Cleveland. He was treasurer of American-Marietta Co.

William J. Ryan was made assistant general manager, **Cleveland Crane & Engineering Co.**, Wickliffe, Ohio. He was plant superintendent.

Jack K. Schultz was made Philadelphia district manager, **Pangborn Corp.**, Hagerstown, Md.

Robert W. Brady was appointed northeastern area district manager for **Disston Div.**, H. K. Porter Com-

You have never used abrasive like this new

ROTOBLAST® STEEL SHOT

1 Vacuum Casting

Electric furnace alloy steel, shotted in revolutionary new vacuum chamber for greater density, eliminating the voids and defects encountered in conventional steel shot. Gives you a fatigue resisting shot of much longer wear life.

2 Continuous Heat Treating in Controlled Atmosphere

Nothing like it in the industry. Uniform heating of every particle, in zero oxygen atmosphere. For the first time . . . ball bearing heat treating quality in a tonnage product . . . gives you uniform hardness and longer life.

New Rotoblast Steel Shot gives you much faster cleaning and the lowest blast cleaning cost ever!

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Pangborn

Rotoblast Steel Shot

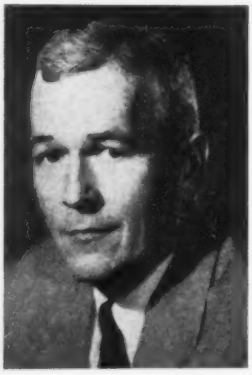
N. V. CHEHAK
Link-Belt Speeder sales mgr.

LAWRENCE A. REINHARDT
Industrial Brownhoist v. p.

WILLIAM E. GRACE
Fruehauf Trailer president

ERIC ECKBERG
Union Spring v. p.-sales

CORNELIUS A. RAUH
Biggs Steel Foundry sales mgr.



ROBERT L. LOZON
Glidden purchasing dir.

pany Inc. His headquarters are in New York.

Eric Eckberg was named vice president-sales, **Union Spring & Mfg. Co.**, New Kensington, Pa. **Cornelius A. Rauh** was made sales manager of the subsidiary, **Biggs Steel Foundry & Fabricating Co.**, Akron.

George M. Seib, secretary of **Oakite Products Inc.**, New York, was appointed vice president of the company. **Erwin H. Steif** was made secretary.

Walter A. Penner was named Denver district office manager for **Worthington Corp.** He replaces **C. R. Walbridge**, resigned.

Dar G. Johnson Jr. was made assistant general sales manager of **Electric Steel Foundry Co.**, Portland, Oreg.

Dr. William H. Schuette, general manager, Midland, Mich., Div., **Dow Chemical Co.**, was elected a company vice president.

Robert L. Lozon was appointed director of purchases and trade relations for **Glidden Co.**, Cleveland. He was general purchasing agent.

Ralph B. Reade was named manager of the new communications division, Airborne Systems Group, **Hughes Aircraft Corp.**, Culver City, Calif. He was with the defense electronics products division of Radio Corp. of America.

Robert L. Patrick was made deputy director; **Lewis Patton**, operations manager, computer services division, **Corporation for Economic & Industrial Research**, Arlington, Va.

Irwin Weinstein was made sales manager of **Trans-Sil Corp.**, Englewood, N. J. He was manager of rectifier sales for Bogue Electric Mfg. Co.

Robert Reed was named manager of **Jones & Laughlin Steel Corp.'s** new fabrication department, (concrete reinforcing bars) Hammond, Ind., a facility of the Chicago district warehouse.

Link-Belt Speeder Corp., Cedar Rapids, Iowa, appointed **N. V. Chehak** sales manager; **D. F. Van de Roovaart**, assistant sales manager. They cover U. S. and Canadian territories.

Lawrence A. Reinhardt was elected vice president and controller, **Industrial Brownhoist Corp.**, Bay City, Mich.

William E. Grace, former executive vice president, **Fruehauf Trailer Co.**, Detroit, was elected president and chief operating officer. **Roy Fruehauf**, former president, was elected chairman and chief executive officer.

R. R. Muller was made general manager of **Flexonics Corp.'s** new aeronautical division, Maywood, Ill. He relinquishes duties as treasurer of Flexonics to head company activity in aircraft, rocket, and missile fields. Aeronautical product manufacturing was assigned to three plants under director of factory managers: **C. W. Schwendener** at Elgin, Ill.; **K. G. Kampenga** at Santa Ana, Calif.; **C. H. Levey** at Memphis, Tenn. **D. W. Ankeney** was made division sales manger. **W. C. Gage** was made advanced program manager; **E. L. Helman**, chief engineer of product design.

Walter H. Kraus, former assistant sales manager, West Steel Casting Co., Cleveland, was named sales representative for **Lectomelt Casting Div.**, Barberton, Ohio, Akron Standard Mold Co.

Eustace Lingle was appointed vice president for industrial sales, **Oakite Products Inc.**, New York.

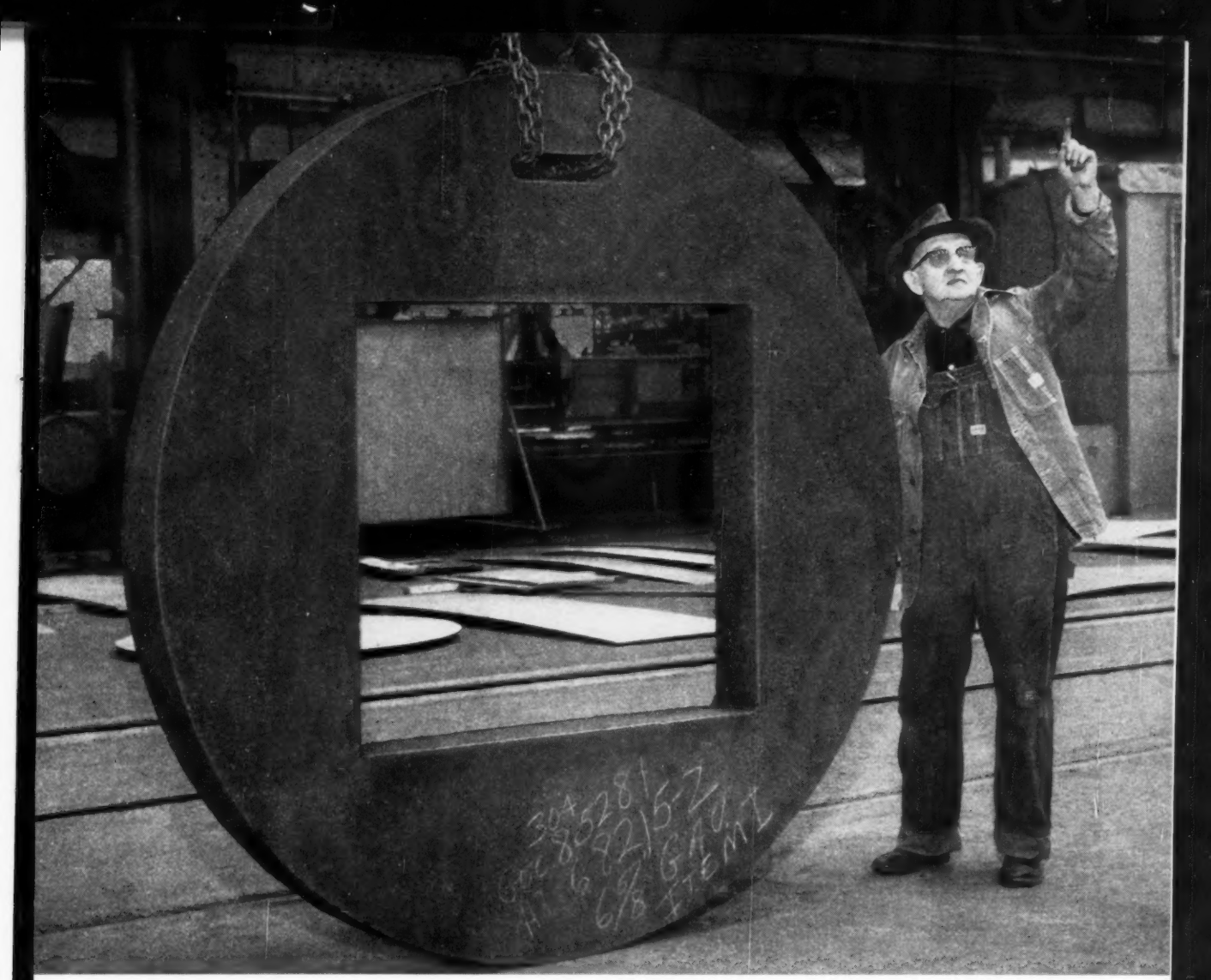
OBITUARIES...

Ernest R. Hinton, 61, chairman, **Olympic Steel Works**, Seattle, died Sept. 14.

Raymond P. Kells, 58, chief service engineer for **Latrobe Steel Co.**, Latrobe, Pa., died recently.

O. S. McGuffey, 62, former chief engineer at **Tranter Mfg. Inc.**, Lansing, Mich., died Sept. 11.

Hughes Dallas, 46, former vice president-manufacturing, **Revere Copper & Brass Inc.**, New York, died Sept. 18.



Type 304 stainless plate, dimensions: 6⅜" thick x 75" diameter. Weight, 8655 lbs.

take a look

...at the clean edges of this stainless plate accurately cut by Carlson

THIS stainless plate illustrates something that's almost a Carlson exclusive. Few producers can make plates of such heavy gauge, and fewer still have the long experience in flame cutting stainless to precise dimensions. To develop the proper equipment, the exact gas and iron powder formula, and the special nozzles, took Carlson engineers years of effort. But the result was worth it.

The edges achieved by these improvements reduce the cost of subsequent machining operations. And every Carlson stainless plate—whether heavy or light gauge—carries its own identification. Its chemical and physical properties are known and recorded. Its dependable performance on the job is assured.

The complete reliability of every Carlson service will materially reduce your ultimate costs. Our specialists make certain that your instructions are followed in every detail. Write, wire or phone for further information on all our services in stainless steel.

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Stainless Steels Exclusively

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THORNDALE, PENNSYLVANIA
District Sales Offices in Principal Cities

PLATES • PLATE PRODUCTS • HEADS • RINGS • CIRCLES • FLANGES • FORGINGS • BARS AND SHEETS (No. 1 Finish)

U. S. Steel Enlarging Facilities

Expansion projects underway include new blooming and structural mill at South Chicago, office building at Fairfield, Ala., and railroad and generating plant in Canada

THE SUPPLY of structurals is being increased. U. S. Steel Corp. is constructing a new blooming and structural mill at its South Works, South Chicago, Ill.

The facilities will consist of a blooming mill for primary rolling operations, with new soaking pits, reheating furnaces, a secondary or breakdown mill, and a cross country, 4-stand structural mill. This mill unit will replace two obsolete blooming mills and two obsolete structural mills.

Tuned to Trend—The mill will produce standard structurals and wide flange beams in the lighter weights, which are in great demand by the construction industry. Capacity will be considerably greater than that of the old mill complement. In addition, the installation should increase the output of the present 52-in. wide flange beam mill—it will no longer be used to produce lighter sections.

It will be possible to replace mill stands to permit rapid changing from structural shapes and semifinished products to wide flange beam sections. Four single stands will be used for rolling standard structural shapes and semifinished products. When wide flange beams are rolled, the single stands will be replaced by three 2-stand and one single-stand universal units. The 2-stand units include horizontal and edge rolling components.

Operation of the mill will be controlled by an electronic card-reading and control system with no moving parts.

The blooming mill is being built by United Engineering & Foundry Co. Controls are products of Westinghouse Electric Corp. Structural stands are being built by Blaw-Knox Co. It'll have General Electric Co. controls. Steel for the blooming and structural mill buildings was rolled at South Works. American Bridge Div., U. S. Steel Corp., designed, fabricated, and is erecting the steelwork.

New Offices—The corporation is also constructing a $200,000 office building at its Fairfield, Ala., tin mill. Completion is scheduled late this year.

Develops Ore Property — The firm's Canadian subsidiary, Quebec Cartier Mining Co., which is developing an iron ore property in northern Quebec, has awarded two major contracts. One is for the construction of a 193-mile railroad—a joint contract to C. A. Pitts of Canada Ltd. and Foley Bros. of Canada Ltd. The railroad will be built along a new access road from Port Cartier on the St. Lawrence River to Lac Jeannine in Saguenay County, Quebec.

A general construction contract to build a 60,000-hp hydroelectric generating plant on the Hart Jaune River has been awarded to the Foundation Co. of Canada Ltd.

Wickwire Moves Facilities

Wickwire Spencer Steel Div., Colorado Fuel & Iron Corp., is moving some of the facilities of its Clinton, Mass., plant to Palmer, Mass. Products involved in the transfer include wire cloth, space and vibrating screens, steel processing belts, hardware cloth, netting, overhead conveying equipment, fire door hardware, and sliding door hardware. The Clinton plant will continue to produce perforated metals.

Valvemaker Changes Name

C. B. Hunt & Son Inc., Salem, Ohio, changed its name to Hunt Valve Co. The company makes air and hydraulic control valves.

Ups Carbon Product Output

National Carbon Co.'s new multimillion-dollar plant at Lawrenceburg, Tenn., is in full-scale operation, producing carbon products. The firm is a division of Union Carbide Corp., New York. Completed late last year, the plant was designed around a process that simultaneously forms and bakes carbon products. It reduces processing time from as long as 8 weeks to less than 8 minutes.

Initial shipments (neary 700,000 lb of carbon brick) went to Great Lakes Steel Corp., Detroit, where they will be used in relining blast furnace "D." It is being rebuilt and redesigned to provide greater capacity.

Inland Buys Product Line

Inland Steel Products Co., Milwaukee, purchased the machinery and equipment for the home building product lines of Gabriel Steel Co., Detroit. Principal products consist of steel and aluminum utility and basement windows, window accessories, lintels, steel basement columns, and steel area walls.

Timken To Install Mill

Steel & Tube Div., Timken Roller Bearing Co., will install a new piercing mill at its Gambrinus, Ohio, plant at an estimated cost of $1.5 million. The new unit will be combined with piercing mill operations, permitting Timken to "double pierce." The new facilities will make it possible to produce hot-rolled tubing (stainless and alloy grades) with thinner wall dimensions and improved inner surface and center wall quality. The equipment is part of the $51-million expansion and modernization program covering the next five years.

Oxygen Output Raised

Air Reduction Sales Co., Air Reduction Co. Inc., New York, has completed an expansion of its oxygen producing facilities at Lorain, Ohio. The project, started in July, 1957, boosts daily production capacity from 40 to 100 tons.

Airco also will build a 120-ton capacity plant for Armco Steel Corp.'s Butler (Pa.) Works. It will be located adjacent to the existing Airco plant, and is expected to be in operation within 18 months.

Heater Company Formed

Arnold Kosarin & Associates, Detroit, has formed Arkos Mfg. Co. to produce a new line of direct-fired heaters. A. Kosarin will head the new firm, which will make the heaters in the former Packard plant in Detroit.

Howard Buys Motor Line

Howard Industries Inc., Racine, Wis., has bought the induction motor line from Westinghouse Electric Corp.'s Lima, Ohio, plant. The plant's equipment will be moved to Howard's Racine plant as was the equipment of Universal Motor Div., Westinghouse Electric Corp., bought by Howard in late 1957. The line purchased includes motors used in business machines, microwave transmitters, blowers, movie projectors, and tape recorders.

Phillips Adds 10,000 sq ft

Phillips Mfg. Co., Bloomington, Minn., is building a 10,000 sq ft addition to its production facilities. The firm, which makes electrical engine heaters for automobiles, trucks, and other mobile equipment, will move into its new quarters around Jan. 1, says G. W. Okerstrom, president and general manager.

Whittset Lifts Capacity

Whittset Steel Corp., Encino, Calif., has constructed a 15,000 sq ft building adjacent to its present facilities, doubling its production capacity.

CONSOLIDATIONS

Roth Mfg. Co., Niles, Ill., purchased the **Illinois Precise Casting Co.**, Chicago, producer of investment castings. Roth is a subsidiary of Vapor Heating Corp., Chicago. W. C. Keeran, vice president of Roth Mfg., has been elected executive vice president of Illinois Precise Casting, which will be operated as a division.

Scranton (Pa.) Corp. acquired control of **Storm-Vulcan Inc.**, Dallas, manufacturer of special machinery and tools for the automotive and airplane manufacturers. Storm-Vulcan will continue production under present management.

National Aluminate Corp., Chicago, is purchasing **Oil Products & Chemical Co. Inc.** and will operate it as a division. Products marketed by Oil Products are chiefly specialized lubricants used in the cold rolling, drawing, cutting, and forming of steel. The company also produces corrosion inhibitors, industrial cleaning compounds, and other type lubricants for use with alloys difficult to draw.

NEW OFFICES

Aluminum Co. of America, Pittsburgh, established a sales office at 3813 Hillsboro Rd., Nashville, Tenn. Chester O. Gordon Jr. is the resident representative.

California Diamond Tool Co. moved to expanded quarters at 7809 S. Western Ave., Los Angeles, Calif.

Lunkenheimer Co., Cincinnati valve manufacturer, moved its Boston sales office and warehouse to 313 Mystic Ave., Medford, Mass.

Thermo King Corp. moved to 314 W. 90th St., Minneapolis 20, Minn. The firm makes refrigeration and air conditioning equipment and communication and navigation systems.

NEW PLANTS

Universal-Cyclops Steel Corp., Bridgeville, Pa., opened its specialty steel service center at 15 Sagamore Rd., Worcester, Mass. The new center has a floor area of 30,000 sq ft, more than three times that of the previous quarters on Ward Street, that city. Stocks of high speed steels, tool steels, and stainless cold heading wire are carried.

Midcontinent Tube Service Inc. is erecting a warehouse on a site at the rear of its main building at 2120 Lee St., Evanston, Ill. Overhead electric traveling crane facilities and cutting and handling equipment are being installed to accommodate the largest and heaviest steel products commonly found in steel service centers.

Eastern States Steel Corp., East Bridgewater, Mass., established a branch warehouse at Westerly, R. I. Alden P. Stanton is manager for Rhode Island Div. Facilities include those for hot and cold-rolled products, structurals, plates, welded wire fabric, and deformed reinforcing bars.

Caterpillar Tractor Co., Peoria, Ill., has begun limited production of tractors in its new Aurora, Ill., plant. Full scale operations are scheduled for 1959. A. N. Whitlock is manager of the 1,280,000 sq ft facility.

ASSOCIATIONS

Robert C. Strassman, Badger Die Casting Corp., Milwaukee, was elected president of the **American Die Casting Institute**, New York. Gordon C. Curry, Dollin Corp., Irvington, N. J., is the vice president. David Laine and W. J. Parker were re-elected secretary and treasurer.

Independent Wire Rope Manufacturers Association, Washington, was organized recently. Officers include J. E. Josendale, Wire Rope Corp. of America, St. Joseph, Mo., president, and C. Willman Brown, secretary.

Four of the headquarters staff of the **American Foundrymen's Society**, Des Plaines, Ill., have been elected officers. William W. Maloney, general manager, continues as the chief administrative officer; S. C. Massari will be technical director. Edward R. May has been elected treasurer; Ashley B. Sinnett, secretary.

Henry C. Frost, Corn Products Refining Co., Chicago, has assumed the duties as president-secretary of the **Instrument Society of America**, Pittsburgh. John Johnston Jr., E. I. du Pont de Nemours & Co., Wilmington, Del., is president-secretary elect. Howard W. Hudson, Panellit Inc., Skokie, Ill., was elected treasurer.

W. A. Montgomery, John Inglis Co. Ltd., Toronto, Ont., was re-elected president of the **Machinery & Equipment Manufacturers' Association of Canada.** Hugh Crombie, Dominion Engineering Works Ltd., Lachine, Que., was re-elected vice president; H. C. Lafleur, Montreal, treasurer.

CHROM-ADD
EXOTHERMIC 1 FERRO-CHROME
Ohio Ferro-Alloys Corporation
Canton, Ohio
25 LBS. CHROMIUM
3 LBS. CARBON
EXOTHERMIC FERROALLOYS
CHROM-ADD
EXOTHERMIC 2 FERRO-CHROME
Ohio Ferro-Alloys Corporation
Canton, Ohio
25 LBS. CHROMIUM
2 LBS. CARBON
CHROM-ADD
EXOTHERMIC 3 FERRO-CHROME
Ohio Ferro-Alloys Corporation
Canton, Ohio
25 LBS. CHROMIUM
1.25 LBS. CARBON
CHROM-ADD BRIQUETS
(EXOTHERMIC FERROCHROME)
12 BRIQUETS CONTAINING
EXACTLY 2 LBS. CHROMIUM EACH
CHROM-SIL-ADD
EXOTHERMIC 1 SILICOCHROME
Ohio Ferro-Alloys Corporation
Canton, Ohio
18 LBS. CHROMIUM
9 LBS. SILICON
0.5 LBS. CARBON
OM-SIL-ADD
MIC 2 SILICOCHROME
Ferro-Alloys Corporation
Canton, Ohio
22 LBS. CHROMIUM
11 LBS. SILICON
0.35 LBS. CARBON
MAN-ADD
EXOTHERMIC MANGANESE
Ohio Ferro-Alloys Corporation
Canton, Ohio
40 LBS. MANGANESE
4 LBS. CARBON
MAN-ADD
EXOTHERMIC MANGANESE
Ohio Ferro-Alloys Corporation
Canton, Ohio
40 LBS. MANGANESE
0.80 LBS. CARBON
For ladle additions to iron and steel we have a complete line of exothermic alloys. Their use, in place of conventional ferro-alloys, may offer substantial improvement in efficiency and alloy recovery.
Write for our brochure which tells how these products may benefit you.
QUALITY
SERVICE
DEPENDABILITY
Ohio Ferro-Alloys Corporation
Canton, Ohio

STEEL

September 29, 1958

Technical Outlook

ATOMIC AUTOS— Dr. R. D. Bennett, General Electric Co., Pleasanton, Calif., suggests that some day we may have no choice but to power our cars with atomic energy. He pointed out that we build some billion horsepower into auto engines each year—a larger power market than all utilities. The atomic authority hinted that significant steps have been made in improving the efficiency of nuclear powerplants.

FORD ON GUN DRILLING— Here's what engineers at the new engine plant in Lima, Ohio, have to say about it: At 3000 rpm, it's about four times faster than conventional twist drills in putting ⅜ in. holes in cast iron. With a carbide cutter tip, you must have a close fitting rotary bushing to prevent waviness and walking. Ford uses the method only on the deepest holes to keep pace with conventional drills on shorter holes. Other features: Surface finish is about 60 microinches rms, or better, compared with 120 to 160 for twist drills; gun drills demand top quality castings—porous metal or inclusions are extremely costly; a heavy cutting oil is preferred to soluble oils.

X-RAY IN THE MINE— The percentage of zinc in mine wastes (tailings) is determined quickly and continuously by an x-ray spectrograph at a Canadian mining firm. Philips Electronics Inc., New York, says the unit completes an analysis in 1 minute. It is expected to contribute to lower zinc costs through more efficient processing.

SAVINGS BY THE PAILFUL— By using wire from pails, Fasco Industries Inc., Rochester, N. Y., saves almost $20,000 a year. Pails hold ten times as much wire and cut rethreading into coilers 90 per cent. Pails are disposable type so investment in returnable spools is eliminated. The idea came from engineers at the Container Div., Jones & Laughlin Steel Corp., Pittsburgh.

GAS SUPERDETECTOR—If you must detect extremely minute amounts of gas (say 2 parts in a billion), you'll be interested in a new device shown at last week's Instrument & Automation Conference, Philadelphia. It uses a radioactive substance to create ions. By passing a gas sample (chemically converted into a cloud of fine particles) through the ion chamber, it picks up or borrows electrons. What gas or gases are present depends on the number of electrons picked up. Uses: It detects and measures ammonia, carbon tetrachloride, hydrogen cyanide, and trichlorethylene.

WATER CURE— Flow efficiency of compressed air and ventilation ducting can be greatly improved by a mockup devised by engineers at Buell Engineering Co. Inc., New York. Thin partitions are placed on the bottom of a pan 5 in. deep so they resemble the cross section of a duct plan. Water flowing from one side of the pan to the other simulates air flow and reveals shortcomings of the proposed system. Adjusting partitions smooths the flow and serves as a guide for engineering alterations.

MORE THRUST—Army missilemen announce that Thiokol Chemical Corp., Huntsville, Ala., has a solid propellent rocket engine which develops several hundred thousand pounds thrust.

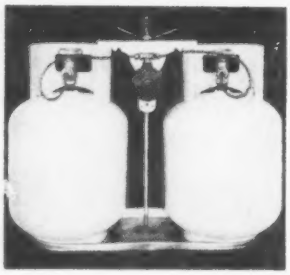
HONEYCOMB MACHINING TWIST— Production men at Convair's Ft. Worth, Tex., plant have removed a bottleneck by contouring honeycomb cores while they're compressed. A cam-guided engine lathe profiles the tapered shape into a tightly compressed core section. After the contouring is complete, the core is expanded. The process precludes the need for tedious hand cutting. Output has jumped from 1 to 20 panels a day.

ROLLING MILL UPGRADED—Three new units have doubled the output of the continuous hot strip mill at Empire-Reeves Div., Universal-Cyclops Steel Corp., Mansfield, Ohio. An intermediate roughing stand, a flying shear, and a downcoiler, all built by E. W. Bliss Co., Rolling Mill Div., have reduced the passes through the slabbing mill from 17-21 to 11-13 and put seven passes through the intermediate roughing mill. The shift of passes from the slabbing mill to the intermediate roughing mill doubled the output (from 15 to 30 ingots an hour).

Metalworking Outlook—Page 49 Market Outlook—Page 113

THE JOB:

Assemble
weld
paint
5 Gallon,
LP Gas Tanks

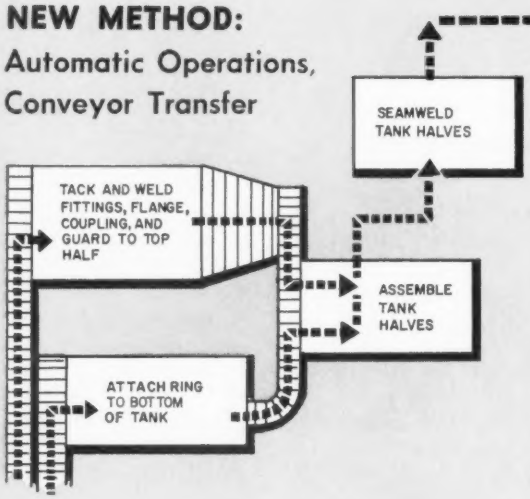


OLD METHOD:

All operations except welding were done manually. Transfer from one station to another was accomplished by workers carrying two tanks at a time

NEW METHOD:

Automatic Operations,
Conveyor Transfer


SEAMWELD TANK HALVES
TACK AND WELD FITTINGS, FLANGE, COUPLING, AND GUARD TO TOP HALF
ASSEMBLE TANK HALVES
ATTACH RING TO BOTTOM OF TANK

How We Beat the Cost Crisis

Production Revision Slashes Part Cost

Every production operation and the material handling system were revised to bring economy to this company. Case history shows how alert management can trim production costs and boost efficiency. The article is one of the top entries in the Cost Crisis Awards Competition. Another will be published next week

ANY TIME you try to make a standard product in large volume without using standardized production methods, you're likely to be in trouble.

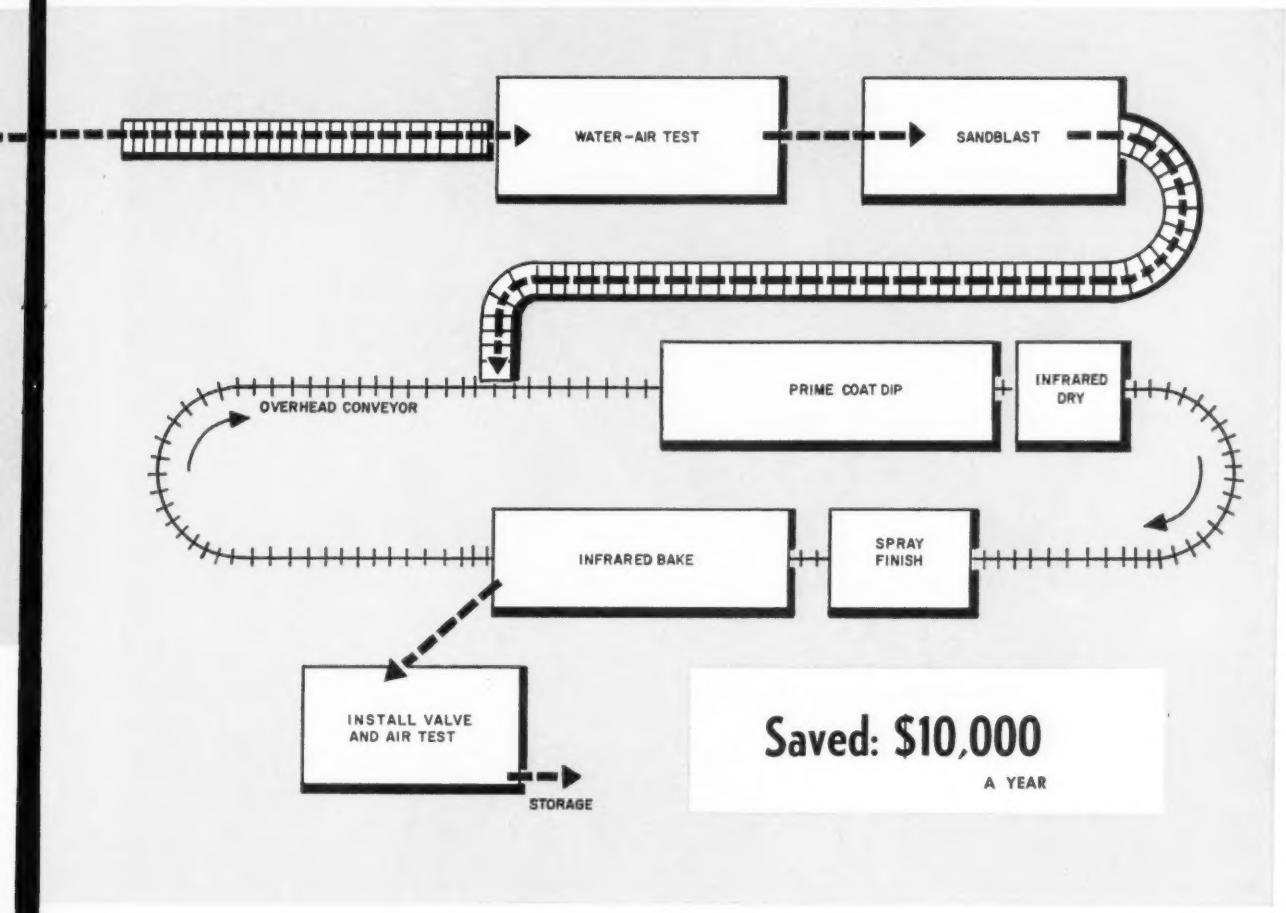
That's the conclusion of management at Manchester Tank & Equipment Co., Lynwood, Calif. The product: LP-gas tanks with capacities of 1½ to 200 gallons. Production: Up to 40,000 units a year. Darrel Reifschneider, engineer, says all material handling was done without the aid of conveyors or any other accepted material handling equipment. In most cases, the worker merely picked up two tanks and carried them to the next operation.

The biggest production item is a 5-gallon vertical tank, commonly used in mobile homes. All components are purchased. The production operation included assembly and welding, testing, sandblasting, painting, installing valves, and a final air test. Tanks are built from two dished halves (top and bottom heads), plus the attachments.

Old Way — Components were stacked on the floor. At each stage, the operators picked up the components, did the assembly, testing, and finishing with hand operations. Only the joining of the two tank halves with a welding machine was automatic.

Between operations, parts were piled on the floor, picked up by the operators, and hauled to the next station. It sometimes meant carrying them 20 ft.

Equipment—To bring about a 38



per cent saving, Manchester management authorized the purchase of about $20,000 worth of new equipment, including more than 300 ft of conveyors, a Wheelabrator sandblast machine, two infrared ovens, and the tank-type flowcoater for primer painting.

New Way—Bottom heads (with a ring for each one) are loaded on a powered conveyor. It moves the parts to a hydraulically operated jig, where the ring is attached. The completed subassembly moves on another conveyor to the assembly area.

Top heads (with a guard for each) go on a conveyor to the welding station where one man tacks fittings in place. Using a special worktable, he also welds the coupling and finish welds the flange to the outside. Finally, he installs and welds the guard. Finished top heads go on a conveyor to meet the bottom heads in the assembly area.

At the assembly area, the two halves are tapped together, then snugged up on a hydraulic press. Completed assemblies go to the welding machine where new welding rods and fluxes permit completion of the weld in one pass. It used to take two.

A roller conveyor carries tanks from the welding machine to the testing station, where pressurized tanks are submerged in water to check for leaks. The tanks are filled with water and pressurized to 480 psi as a second leak check. After that, they go to a storage area adjacent to the blast-finishing machine.

The two-wheeled Wheelabrator blasting machine processes 50 to 75 parts at a time. Next, tanks go on a roller conveyor to a point where they are picked up by carrying rods suspended from an overhead chain conveyor.

This conveyor carries tanks through the flowcoat primer, a small infrared drying oven, a station for manual spraying the finish coat, and a force dry baking oven.

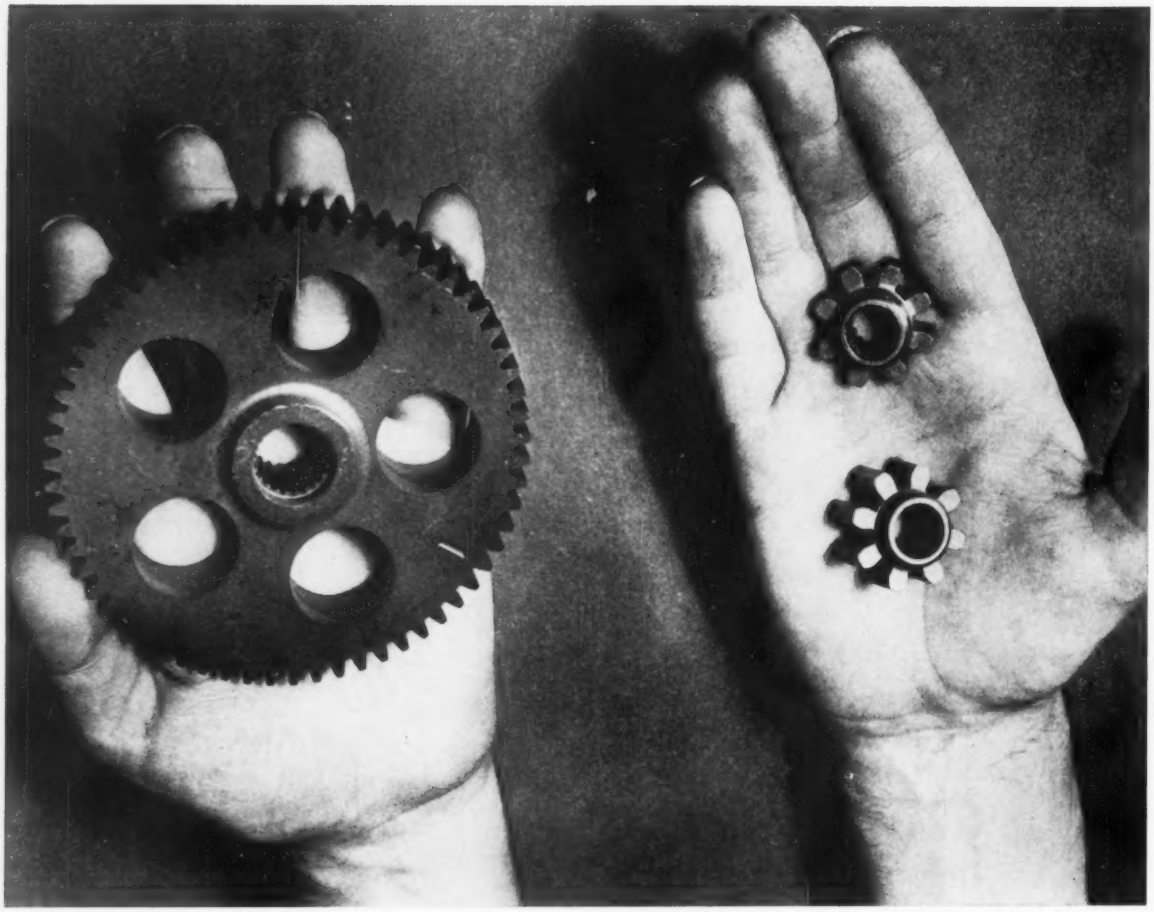
After they're baked dry, the tanks are lifted off the overhead conveyor rods and given the final pressurized air test.

Big Savers—The over-all cost reduction of 38 per cent per unit can be attributed chiefly to better handling and process improvements.

First, the old assembly and welding system took four men to turn out 180 units a day. The job is now done with special work stations and fixtures. Only three operators are needed.

Second, automation of the testing operation has increased output from 200 to 250 units a day. And the addition of the air test has boosted the reliability of the tests.

Third, about four men used to sandblast and paint 180 tanks a day. Quality was inconsistent. Now finish quality is boosted, and two men abrasive blast and paint 200 to 225 tanks each day.



Important parts in hoists are brake hubs (left), which connect brakes to driveshaft, and intermediate gears (right). They illustrate trend to heavier powder metallurgy parts

Powdered Metals Improve Hoists

Such parts can cost less and improve quality at the same time. Here's how one hoistmaker uses them in vital locations to get more mileage from small units

POWDER metallurgy meets the toughest industrial requirements for parts in material handling equipment, says Chisholm-Moore Hoist Div., Columbus-McKinnon Chain Corp., Tonawanda, N. Y.

The firm finds them more than adequate for vital spots like transmission and brake mechanisms and in overcoming shock problems in 1-ton electric chain hoists. Such parts are extremely small yet rugged enough to withstand the stresses of rapid starting and stopping.

Example—By changing to powdered metals, Chisholm-Moore upgraded its equipment and shaved costs: Brake hubs now cost 70 cents less than their machined counterparts; a gear train operates more efficiently; a cam and several bearings require no provision for lubrication.

How Design Fits — The firm's hoists use regenerative braking. In hoisting, the motor sustains the load. In lowering, the motor becomes a generator which holds the load and lowers it at a set speed. A heavy vertical disc-type magnetic brake works almost instantly.

The brake hub is the key component. Friction discs in the electric brake assembly are splined to

the hub which in turn is splined to the driveshaft to form a direct connection to the motor. The brake hub allows the discs to positively control the rotation of the driveshaft and load speed. An electromagnet pulls an armature away from the discs so they can turn. When the magnet is turned off, the armature plate is released and spring tension forces the plates against the friction discs. This stops shaft rotation.

The hub used to be machined from bar stock. The new part is made of powdered iron infiltrated with copper. Final composition corresponds to SAE Type 7 with a density between 7.1 and 7.6.

Hubs are treated in a carburizing salt bath at 1650° F, then water quenched to Rockwell hardness G60 to G92. (Tensile strength is about 140,000 psi; compressive strength near 160,000 psi.)

Such parts and other members of power trains stand more than seven times their normal rated loads.

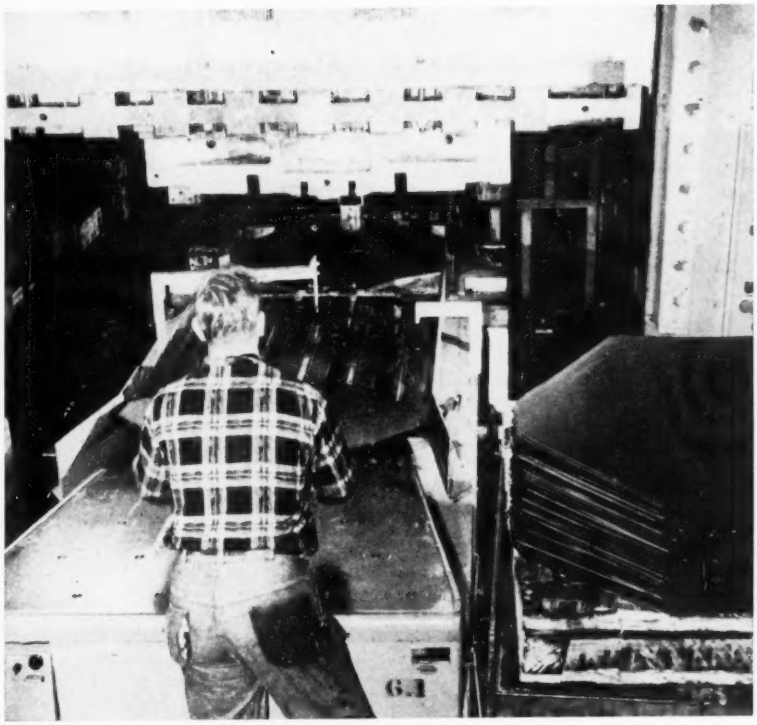
Improved Transmission — A simple, efficient, two-reduction gear train helps the electric hoist lift heavy loads more positively. An essential part is the intermediate gear which must be strong enough to transmit power from the motor to the lift wheel smoothly and quietly.

The gear is pressed and sintered from an iron powder blend like SAE Type 5 to quite accurate dimensions. (The 4.653 in. diameter is within 0.005 in.; runout is less than 0.004 in.)

Another Part—A brake cam for a hand-operated puller is made of powdered metal and is rugged enough to withstand abuse yet retain enough sensitivity for an operator's sense of "feel." The part is oil impregnated.

Made by conventional methods, the odd-shaped helical surface would be prohibitively expensive to reproduce and would require external lubrication. The self-lubricating property of powdered metals gives more uniform operation, greater freedom of action, and reduced effort in lowering.

Chisholm-Moore also makes several parts for its ratchet lever hoist and bushings for all rotating bearing points. They are said to retain their original lubrication for the life of the device.



Loading a reinforcement blank so that it will be positioned in the die area by the part-handling fingers. Control dial can be seen at the operator's left

Control Simplifies Loading

Exact workpiece location for forming is provided by a system of electric motion control. Operation is simple, and torque adjustment is rapid

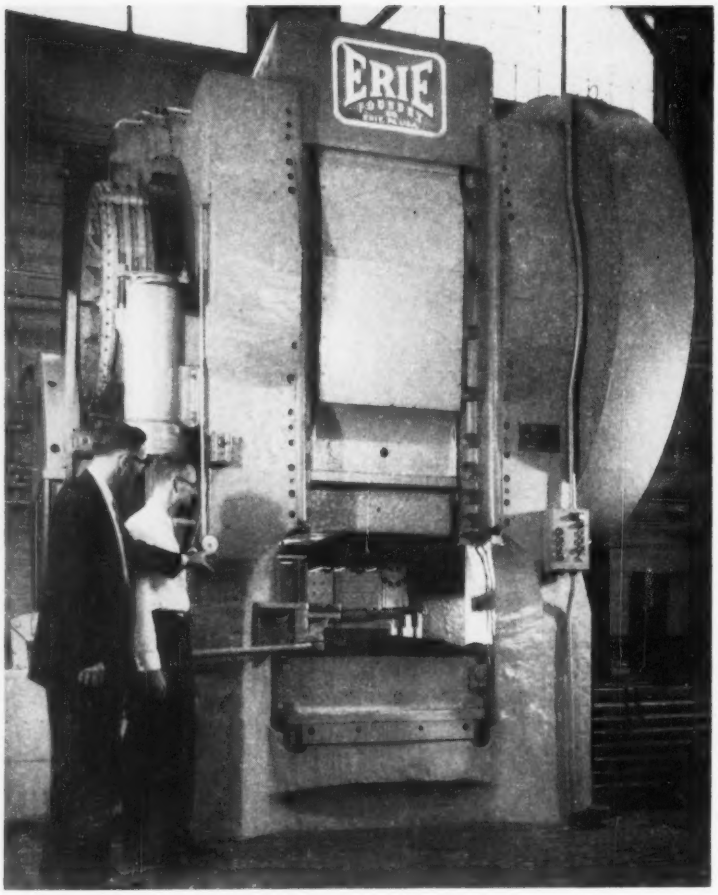
ONLY ONE operator is needed to move blanks in and out of a forming die when equipped with an electric brake and clutch control. This semiautomatic handling of Mercury door hinge reinforcement members at the Ford Motor Co. stamping plant, Chicago, provides fast and accurate positioning.

Incoming blanks are dropped down an inclined chute under rubber rollers to the die area. When the press cycle is started, a series of fingers pushes the workpiece under the die and positions it precisely against a stop.

Loading Force Adjustable—If the blank bounces offcenter from the stop because too much force is being exerted, the torque can be reduced by turning a rheostat knob on the clutch brake control.

A unit made by Warner Electric Brake & Clutch Co., Beloit, Wis., controls the drive for the loader, including the part-handling fingers. The sidearm extractor which removes the formed piece from the press is actuated by limit switches on the ram. The extractor, designed by Ford, also uses a Warner electric control.

New mechanical forging press handles hot blanks through dies. It can turn out 1200 track link forgings an hour with long die life. Only one operator is needed. If desired, the press can trim the forging at its last station



Robert E. Sanford, engineer who designed Erie Foundry's automated forging press, points out a feature of the handling mechanism to a fellow worker. The 2500-ton mechanical press is 3 ft shorter than contemporary machines

Automation Triples Forging Output

AUTOMATION has come to the forging industry.

Erie Foundry Co., Erie, Pa., has developed an automated forging press that will outproduce a crew operating a hand-fed unit two or three times.

The 2500-ton press is designed for high volume forging of parts such as connecting rods, gear blanks, auto and tractor valves, stem pinions, ring gears, track links, and wheel hubs.

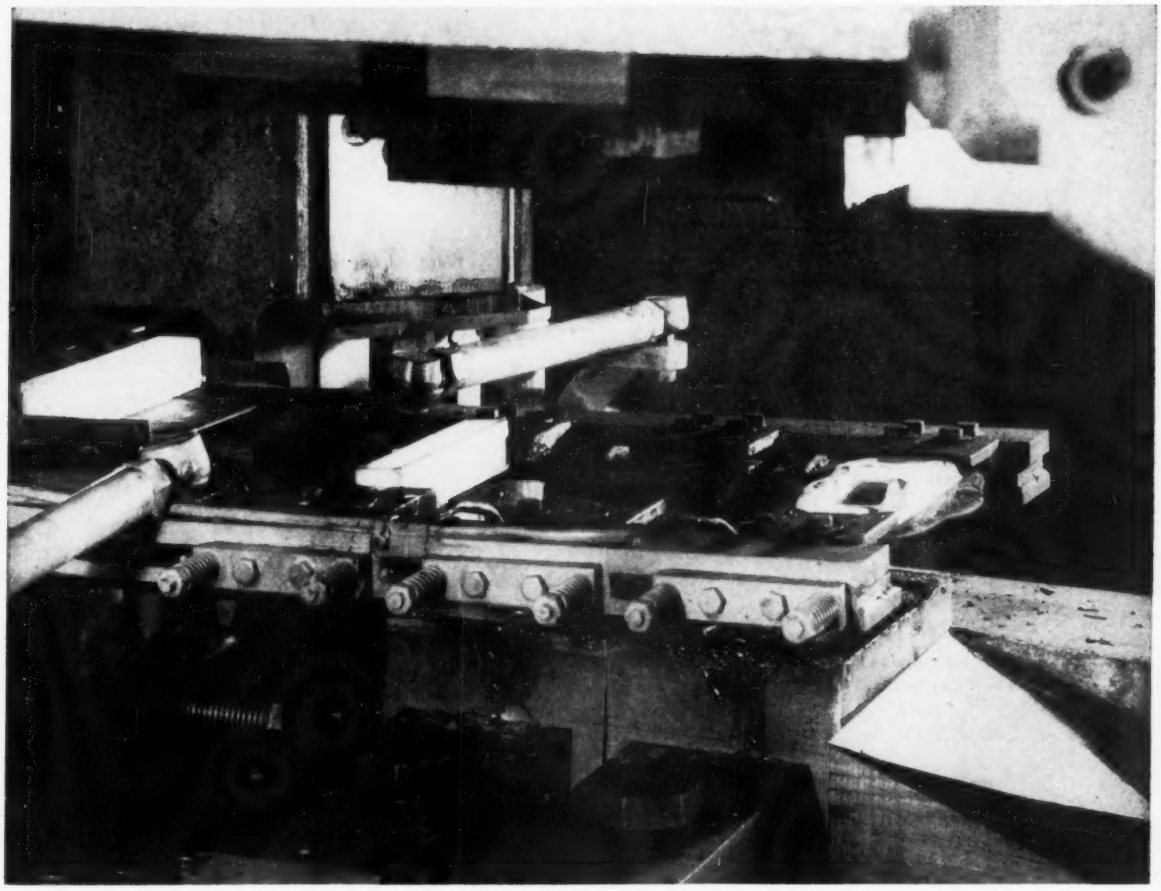
Major testing of the press and its automated handling equipment has been done with a set of dies for crawler track links. The dies are owned by a major farm machinery manufacturer.

Production Compared—James A. Currie, president of Erie Foundry, points up the productivity of the new press this way: A steam hammer with a crew of three men could forge 275 of the track links an hour; a hand-fed mechanical press with a crew of three could turn out 350 track link forgings an hour. The automated press, with a hot bar fed through the dies on every other stroke (to increase die life) can make 1200 forgings an hour. It requires only one operator.

The savings possible through tripled production and slashed labor costs could easily pay for the press within two years, Mr. Currie estimates.

Can Also Trim—An additional advantage of the press is its ability to trim. Up to four forging and trimming steps can be incorporated into the press.

If the Erie automatic is to handle trimming, two or three trimming



Close-up of the mechanical transfer device shows the two horizontal arms on which the grip fingers are mounted. A finish-forged track link has been lifted from the third station and will be dropped into the chute. The fingers are transferring a hot bar into the semiforging station

presses and their operators could also be eliminated.

Result of Survey—Erie Foundry's press is the result of a survey the company did to determine needs in the forging industry (see STEEL, Mar. 17, p. 108). Design Engineer Robert E. Sanford, who developed the automated unit, found that the problem did not lie in the automation, but rather in the handling of pieces at forging temperatures of 2000 to 2400° F.

Mr. Sanford's design is a mechanical transfer mechanism that picks up the hot bar in station 1, transfers it to station 2 where it is semiforged, and takes it on to station 3 for finish forging. A fourth station, for trimming, can be added.

Through the Press—The hot bar is delivered from the furnace through the left window of the forging press. A pusher positions it at the pickup station. Fingers grip the bar, move it horizontally, and place it on the first die. The fingers move out as the upper die comes down and forges the bar. Knock-out pins lift the forging from the die so it is in position for the grip fingers on the next transfer.

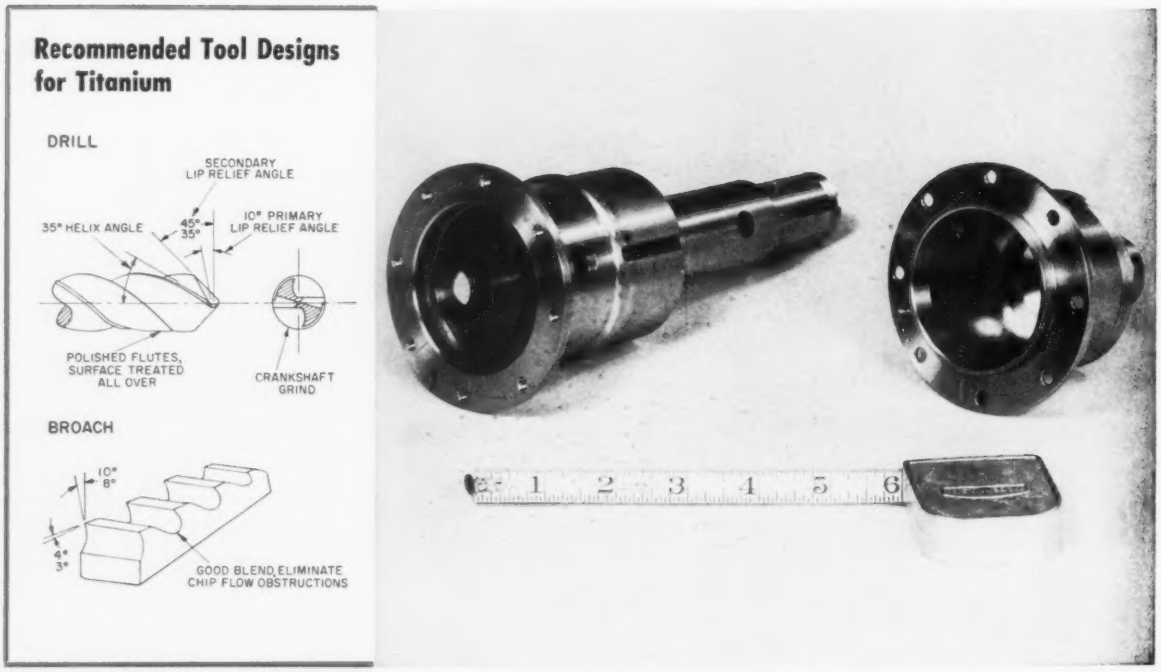
The operation is repeated through the third and fourth stations. After the fourth station, the grip fingers pick up the forging, carry it over, and drop it into a chute where it slides into a tote box.

Design of Mechanism—The grip fingers are mounted on two horizontal arms that extend through the large left window of the press. One arm is back of the dies, and one is in front. The links and levers that move the arms are outside the die area, making it easy to adjust or change the dies.

In operation, the press runs continuously. The automatic feed is chain driven from the eccentric shaft of the press, insuring accurate timing, regardless of speed. The kick-out pins are operated from a cam on the eccentric shaft.

One of a Line—Erie Foundry has designed the automated press in capacities of 1000 through 8000 tons. The company is also considering an "economy" press line for jobbing shops which require high production but don't need large tonnages. Such presses might start at 500 tons.

The biggest market for the 2500-ton press, and others in its line, seems to be in the large captive forging shops for replacement, Mr. Currie believes. "The forging industry has already realized the advantages of presses over hammers," he explains, "and automation through-the-press is the next step forward."



Two titanium forgings, totaling 10 lb and costing $200, make up each assembled generator shaft. The shaft (shown at right) is hollow. The major flange diameter is about 3 in. Finished weight is 2 lb 8 oz, while the steel counterpart weighs 4 lb 6 oz

Solved: One Titanium Machining Problem

Drilling and broaching prove difficult on complex aircraft parts. Special tool designs and careful control on speeds and feeds turn the machining trick

TWO weight-saving aircraft generator shafts had to be made from titanium at General Electric Co.'s Direct Current Motor and Generator Dept., Erie, Pa. The complex parts turned up several machining problems. This article tells how they were solved.

The alloy, designated RC130B, has a 130,000-psi tensile strength, good elongation, and low density. Each shaft was turned from two rough forgings which were annealed to assure stability.

Trouble Spots — The two most troublesome machining operations were deep hole drilling and internal splining. Drilling was difficult because of seizure between the hole and the drill lands. This was overcome with a special, crankshaft-ground drill, says A. J. Wesolowski, aircraft generator product engineer. (See the drawing.)

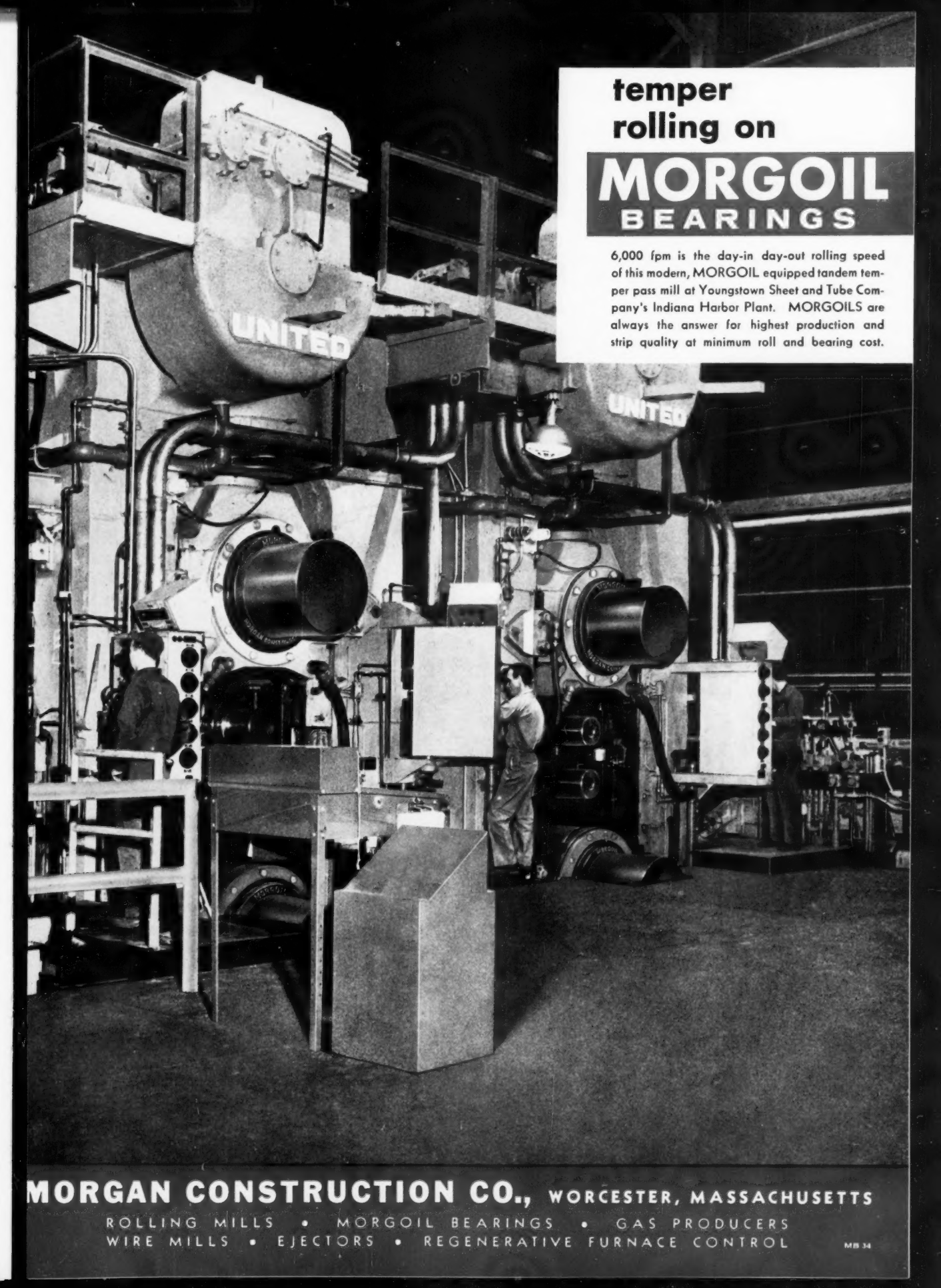
Drills should be high speed steel with polished grooves, preferably chrome plated. Surface cutting speed should be about 20 fpm with a feed of 0.006 to 0.009 in. a revolution. Power feed is a must. Short drills should be used. Sulfur-base oil is a good coolant.

Broaching—The broach, designed for steel cutting, jammed on the first few cuts and had to be removed by cooling in a mixture of liquid nitrogen and acetone, after which the spline was completed in a gear shaper.

The proper broach for the job, says Mr. Wesolowski, is high speed steel run at a cutting speed of 30 fpm, and a rise per tooth of 0.008 to 0.010 in. for roughing and 0.0015 to 0.002 in. for finishing.

Sulfur-base oil also is recommended for the broaching coolant. Cutters should be sharpened wet to prevent burning the edges. Also, cutter faces should be superfinished to minimize chip welding.

Mr. Wesolowski also cautions that titanium is susceptible to grinding cracks. He believes the coolant should be soluble sodium-nitrate-amine solution—mixed 10 to 1. The optimum wheel speed is reached when sparking is at a minimum.



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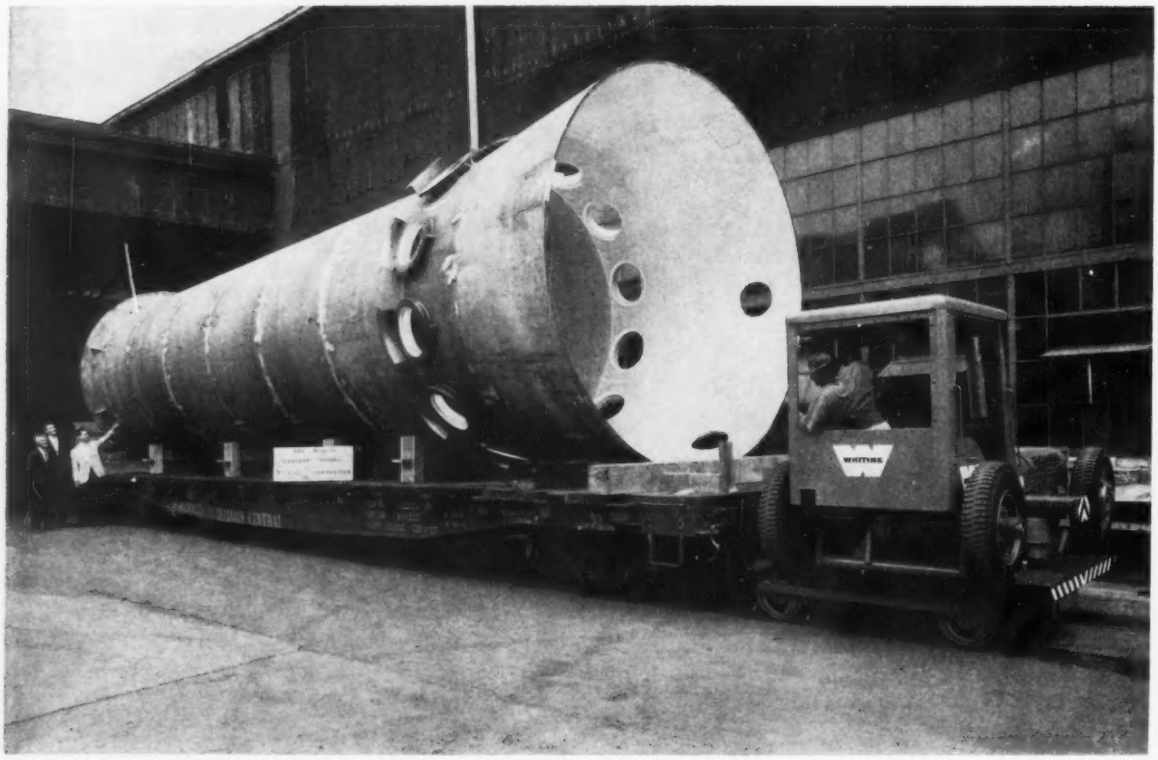

First of two huge cupolas leaves Whiting Corp.'s Harvey, Ill., shop, bound for Acme Steel Co.'s plant at Riverdale, Ill.

Steel Plant Installs Cupolas

Designed to furnish hot metal for oxygen converters at Acme Steel's Riverdale (Ill.) Plant, they have such unusual features as high top pressure, hot blast, and split wind blowing

EXTRAORDINARY is the word for the two cupolas which will provide hot metal for Acme Steel Co.'s new oxygen converter steel plant at Riverdale, Ill.

Not only are they the biggest yet, says Whiting Corp., Harvey, Ill., the builder. They'll operate with high top pressure, hot blast, and split wind blowing.

The Riverdale plant will be the first major cupola top blown oxygen converter installation. Others, except for one small installation in Germany, use blast furnace hot metal. The combination is geared to the high scrap potential of the Chicago area.

Ready in 1959—When the plant goes into operation early next year, it will have a capacity of 450,000 annual ingot tons. This will provide the company with a large proportion of its semifinished steel requirements (the Riverdale plant has been buying slabs and billets from outside sources).

The oxygen converter steel, low in nitrogen, phosphorus, and sulfur, will be rolled into strip for the automobile industry, and for Acme's line of steel strapping.

Great Capacity — The cupolas will have an inside diameter of 156 in. at the base plate and 114 in. at the hearth. They will accom-

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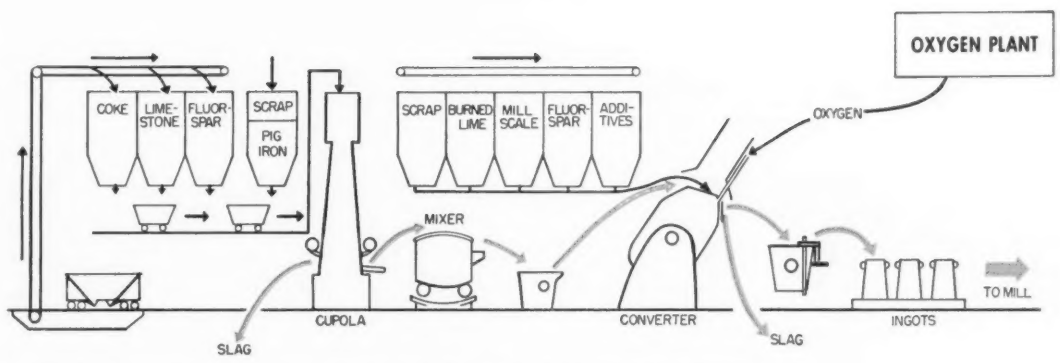


Except for dependence on scrap, layout has the look of an integrated plant

modate a 40 ft column of raw materials (a typical cupola stock column is about 25 ft).

Both will be water cooled in the melting zone and stack, and will require no lining except in the well. Body and stack shell will be of 1½ in. plate, mounted on a 2 in. base plate. The cupolas will be equipped with copper, water cooled, blast furnace tuyeres.

Charging Automated — Metallic charge make-up will be handled by steel mill type stock yard cranes with magnets. These will load the metal charge components into batch weigh hoppers.

Coke, limestone, and fluorspar will be stored in overhead bins. Vibrating feeders will deposit predetermined amounts of these materials into a motorized batch weigh lorry. The weighing lorry will in turn load charging buckets which are carried on a trolley over the top of the cupolas.

High Top Pressure—The trolley will lower the drop-bottom bucket into a gas lock at the top of the cupola. When a cover has sealed the lock over the top of the bucket, doors at the bottom of the lock will open, permitting the bucket to dump its charge, and at the same time maintain gas pressure in the stack.

The gas lock is designed to maintain top pressure as high as 15 in. water gage. This feature will result in the recovery of most of the heat from the five gages and eliminate the discharge of dust and smoke from the cupola top. In addition, melting time will be shortened and coke consumption decreased.

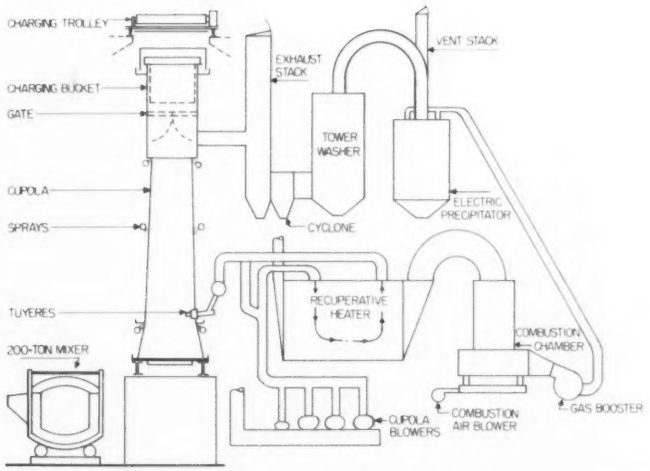
Split Wind Blowing—High pressure positive displacement blowers will be installed to furnish wind at a rate of 30,000 cfm. A split wind valving system will make it possible to operate both cupolas simultaneously.

The blast will be heated to 1200° F by a recuperator fired by waste gas from the cupolas.

Gas will be cleaned before it enters the combustion chamber of the recuperator by a combination electrical-mechanical system. Employing cyclones, a tower washer, and electrical precipitator, its cleaning efficiency is expected to be 99.6 per cent.

To the Converters—Molten iron from the cupolas will be tapped into two 200 ton hot metal mixers. They will be gas fired. Iron will be transferred from the mixers to the converters by 60 ton lip pour ladles.

The converters, blown by 99.5 per cent pure oxygen, are expected to tap 50 tons a heat. Acme's Riverdale installation is sure to be closely watched. Nothing like it has been seen in American steelmaking circles since the heyday of the bessemer converter, when cupola-bessemer combinations were popular.



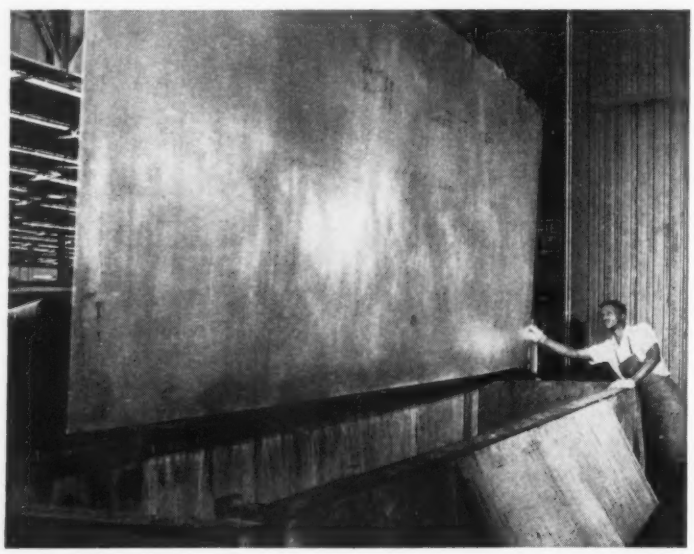
Gas cleaning and blast heating and proportioning systems are unusually intricate

Columbia-Southern Trichlor provide economical answers

An exclusively developed neutral stabilizer in Columbia-Southern Trichlorethylene has aided metal fabricators in eliminating a number of troublesome degreasing problems.

In the past, many plants experienced extreme difficulties, resulting in damage to work or the degreaser itself. Frequently these difficulties could be traced to use of solvents "stabilized" with the inadequate alkaline amines.

Columbia-Southern Trichlor, on the other hand, is formulated to provide a stabilizer that assures built-in chemical protection against breakdown under light, heat, oxygen, acids, moisture and repeated distillations.



Aluminum sheet and formed parts are particularly sensitive to improperly stabilized solvent. Neutrally stabilized Columbia-Southern Trichlor is now specified by many large volume aluminum fabricators.

and expert Technical Service to vapor degreasing problems

Vapor degreasing offers an extremely flexible and low-cost cleaning method for parts ranging in composition from aluminum to steel, zinc, brass, magnesium, titanium, special alloys; running in weight from 268 ton generator stators to 1/240 oz. watch gears.

Columbia-Southern Trichlor is completely suitable for removing grinding and buffing compounds, graphite, grease, coolants, quenching and lubricating oils, other contaminants from the most intricately drawn or shaped parts. Parts come out thoroughly clean and dry, ready for next operation.

As a further bonus, Columbia-Southern Technical Service representatives work with customers in trouble-shooting and in establishing more effective and economical procedures for degreasing. These men have earned a reputation for solving the problem. Their services are at your disposal.

Have Columbia-Southern's experts check the efficiency of *your* vapor degreasing operation or help *you* with your solvent specifications. Just contact our Pittsburgh address, or any of the fourteen conveniently located District Sales Offices listed below.

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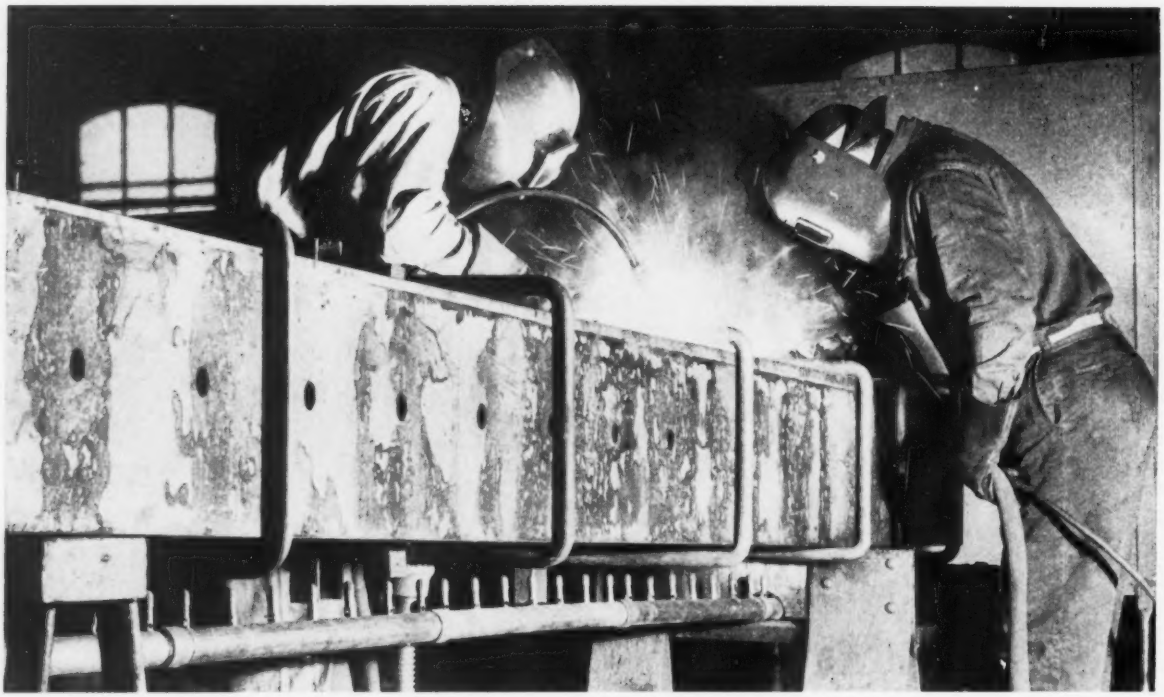

Operators weld electric furnace part for McGraw Edison, Pittsburgh. Side plates are clamped. Flux is self-removing, leaving clean smooth surface. Assembly is preheated

Welder Trims Furnace Cost

Semiautomatic device is 400 per cent faster than manual method. Firm gets better quality with less warpage and spatter. Flux is self-removing

WELDING of large electric furnace parts takes 75 per cent less time with a semiautomatic method than with manual electrodes.

That's the experience of Lectro Products Div., McGraw Edison Co., Pittsburgh, which uses Unionarc, developed by Linde Div., Union Carbide Corp., New York. Other benefits cited: Less spatter and the elimination of warping which used to require costly straightening in a hydraulic press.

Blueprints Method—The electric furnace assemblies are 20 ft long metal sandwiches: A 13-in. tube 1½ in. thick is mounted between two 2½-in. steel plates which are 13 in. wide. Tube sides are machined to match the plates.

The assembly details (they're made of AISI 4140) are clamped prior to welding and preheated with gas to 500° F. After tackwelding, two operators weld from the center toward the ends to minimize distortion. (They use 3/32-in. wire; settings are 425 amperes, 31 volts, direct current, reverse polarity.)

Welding with manual electrodes required backup plates. They're not needed with the semiautomatic. Only two ¾-in. passes are used, vs. three formerly.

Flux is self-removing.

Lectro Products says welding time formerly took 106 manhours. Current time is now about 26 manhours.

Equipment — The Unionarc design depends on a fast feed, high current setting to get deep penetration. Weld metal is protected from oxidation by a combination of flux and carbon dioxide: Dry, fluidized flux is magnetized as it flows into a stream of carbon dioxide. When it reaches the welding head, the magnetized particles of flux are attracted to the electrode. Some of the excess passes into the weld puddle.

The flux hopper, wire reel, and controls are mounted on a small rack. Carbon dioxide bottles are attached to the control system with flexible hoses.

22 Tons of Cast Steel Against The Sea

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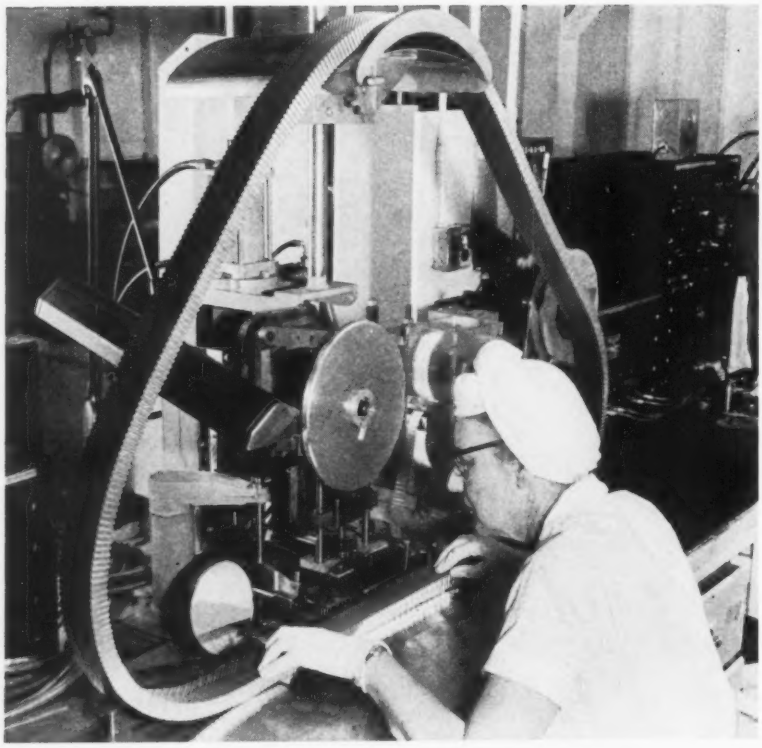


Foil-thin metal ribbon is formed and welded into honeycomb core

Honeycomb Making Advances

Needlelike heads make up to 240 resistance welds a second as this machine produces bands of honeycomb core. It handles high temperature metals and alloys

CORRUGATED strips of extremely thin foil are made into tough honeycomb cores at Solar Aircraft Co., San Diego, Calif. The machine (which took over six years to develop) will form cores to any length and width.

The material has two major uses: It is brazed between two sheets of metal to form rigid airframe structural panels or missile fuselages, and it is used for gas seals for turbine engines.

Making Core—Metal ribbon 3/32 to 2 in. wide and 0.001 to 0.006 in. thick is fed into the machine. It passes through a cleaning solution. After it is wiped dry, rollers shape it into a corrugated pattern.

The strips are pressed against each other, forming strings of square or wave-type cells. Needlelike welding heads move up and down the metal where the convolutions make contact. Electrical impulses weld the strips. Up to 240 resistance welds are made each second.

When one section of honeycomb is welded, the strip moves forward; another section is welded, and the cycle continues, adding layers until the core reaches the desired width.

Licensee—Swedlow Plastics Co., Los Angeles, is licensed by Solar to manufacture and sell the product in the U. S. and Canada. Solar retains the rights to make it for its own needs.

It's available in a number of metals and alloys, including 321 stainless, 17-7 PH, titanium, and zirconium.

Test Detects Zinc

Particles on stainless surfaces can cause cracking during welding operations

A SIMPLE TEST has been developed to detect zinc particles on stainless steel sheets which penetrate grain boundaries and cause cracking during welding.

Zinc is picked up from forming dies. To solve the problem, Armco Steel Corp., Middletown, Ohio, came up with a qualitative test based on color: The zinc reacts with dithizone in an alkaline solution. Cadmium and copper produce similar colors, but they can be distinguished by comparison with a standard.

Procedure Is Simple—

1. Mark the surface of a stainless sheet with samples of essentially pure zinc, cadmium, and copper.
2. Dip a piece of any grade of acid-washed filter paper in a solution of 0.02 gram of dithizone (diphenyl thiocarbazone—Eastman #3092) dissolved in 100 mg of 10 per cent NaOH solution. Let paper drain for a moment, then put it on the marked surface.
3. In a few seconds a colored mark will appear on the paper—reddish purple for zinc, violet for cadmium, and purple for copper.
4. Treat the surface (as described in step 2) of the stainless sheet on which zinc contamination is suspected.
5. Compare the unknown with the standard.

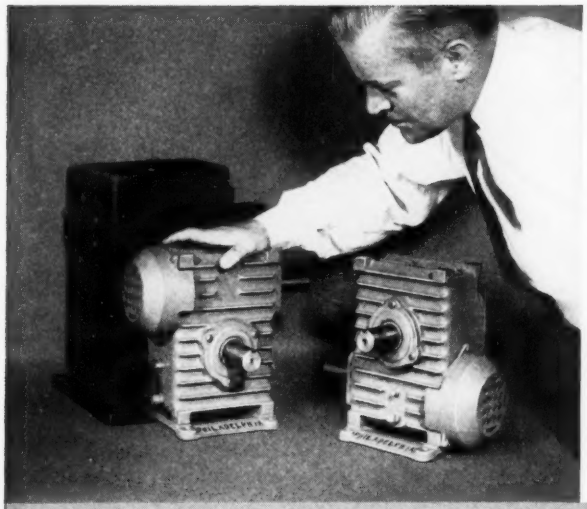
New Bar Steel Offered

Jalcase 100, a cold-finished bar steel, permits significant cost savings in production of wear resistant parts by eliminating (in most cases) the need for heat treatment during fabrication. A minimum yield strength of 105,000 psi is guaranteed in round sizes 1½ in. in diameter and smaller.

An advanced processing technique prevents unbalanced stresses which often result in distortion of high strength steel bars after machining operations.

This high strength steel is free machining. It is produced by Jones & Laughlin Steel Corp., Pittsburgh.

new high capacity fan cooled reducers take up 50% less space



LOOK AT THE SPACE YOU SAVE!

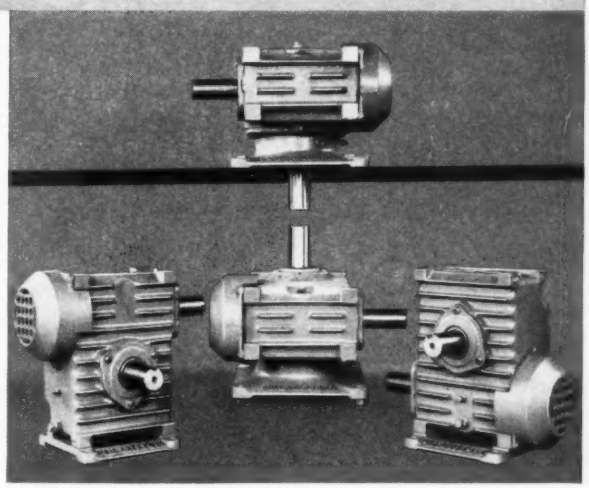
Think what this can mean to your products! You can make important savings in space and weight . . . in the neighborhood of 50% . . . depending upon output torque requirements. Or, you can design for heavier loads . . . up to 80% . . . without adding an ounce of weight to your product. You get more horsepower per dollar!

This new line of Philadelphia Fan cooled Worm Gear Reducers is available in 3, 3½ and 4″ center distances for ratios from 5 1/6:1 to 60:1. Fan cooling, sturdy finned housings, improved tooth forms, precision ground alloy steel worms and special high strength bronze gears all combine to give you a drive that will handle heavier loads in less space.

STANDARD STOCK PARTS SIMPLIFY SELECTION.

These new fan cooled units have a degree of simplicity and flexibility never before available. Standardized housings, fans, gearing and mounting bases permit you to select any drive arrangement you need . . . permit us to give you prompt delivery from stock.

They simplify your design problems too. For Example: horizontal units can be furnished without mounting bases. Housings can be designed as an integral part of your product.



For more information . . . horsepower ratings . . . dimensions . . . construction details . . . write for your copy of Bulletin WG-583.

PHILADELPHIA GEAR CORPORATION

Erie Avenue and G Street • Philadelphia 34, Pennsylvania

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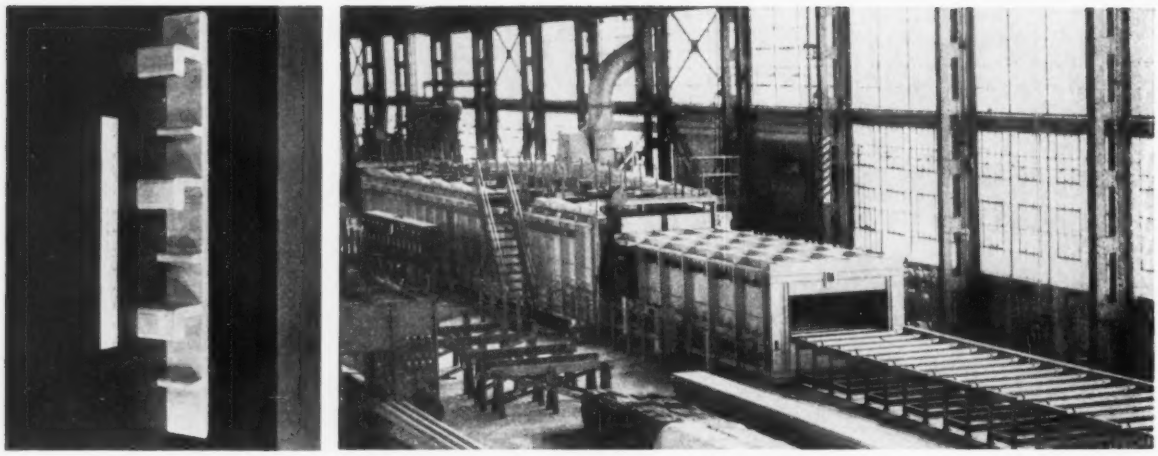
Offices in all Principal Cities • Virginia Gear & Machine Corp., Lynchburg, Va.

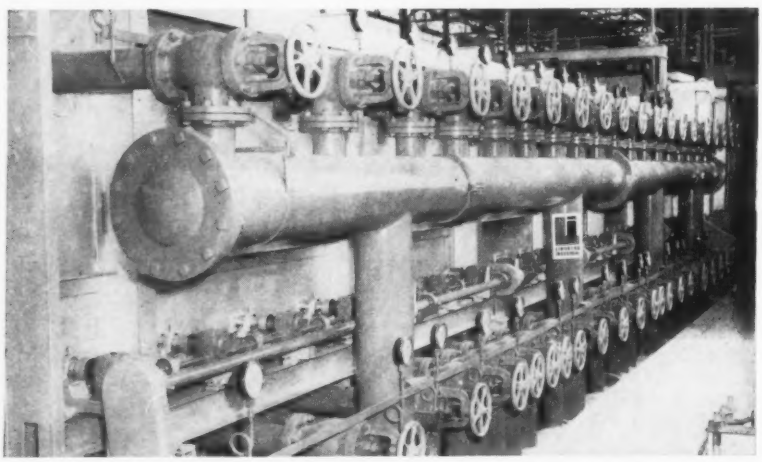
INDUSTRIAL GEARS & SPEED REDUCERS • LIMITORQUE VALVE CONTROLS • FLUID MIXERS • FLEXIBLE COUPLINGS



Here is a typical aluminum extrusion of the type made at Dow's Madison, Ill., plant. Proper support during high heating is one secret to low warping. Solution heat treating furnace (right) handles 90-ft pieces horizontally. Heating chamber is at left, spray quench at center. Extrusions are fed through quench at 100 fpm

Dow Heat Treats Giant Extrusions

Horizontal approach eliminates need for deep pits but poses problem of avoiding excessive warping. Dow's grid adds flexibility and widens furnace range



Close-up of water manifolding which supplies 20,000 gpm at 100 psi to all heads. Adjustable heads at entrance vary quenching effects on odd sections to minimize warping

HOW do you heat treat 90-ft aluminum extrusions horizontally without warping them?

Dow Chemical Co., Madison, Ill., solved the problem with a Lindberg furnace setup and got close dimensions and tight metallurgical results.

How It's Done—Dow's extrusions are up to 24 in. wide and weigh as much as 2700 lb. They are made in its new, 13,200-ton extrusion press. After forming, they are cut to 92 in. Each is solution heat treated and straightened on a stretcher. When aged, a saw cuts them to final size.

Jumping Hurdles—In designing a horizontal furnace, supports for the extrusions presented the major technical problems. During preheating, the aluminum is relatively strong, and a simple oscillating roller hearth is adequate. But as the solution heat treatment temperature is approached, the aluminum gets comparatively weak, and the oscillating action of the roller hearth

conveyor could change cross-sectional dimensions.

To eliminate that, Dow engineers invented a retractable grid which provides full support for the work. The furnace can operate during any portion of the heating cycle with an oscillating roller hearth, a continuous roller hearth, or with the stationary grid in position for continuous support. The best support is programmed for each shape, alloy, and temperature.

Controlling Heat Rate—Temperatures stay within 5° F during operation because all radiation is eliminated from the primary heat source, and large volumes of air are circulated. Vertical radiant tubes mounted on both side walls of the furnace heating chamber are isolated from the work by full alloy baffles. Fans placed alternately in the roof and floor provide adequate circulation. (They are on 10-ft centers.)

Each of ten temperature control zones has its own strip chart recording control pyrometer, radiant tube bank (there are four in each one), recirculating fans, high temperature shut off, and distributor-fed spark igniters.

Describes Procedure—Dow heat treats at 250° F to 1000° F. Large extrusions are placed on a 100-ft, powered charge table at the discharge side of the quench chamber. With the work inside, the drive oscillates. Each roller in the heating chamber has a magnetic clutch. Each roller is released periodically or left on "freewheeling" to compensate for expansion.

Each 90-ft extrusion expands a maximum of 12 in. during heating. If one alloy or shape needs added support at high temperature, controls can automatically stop hearth oscillation and raise support grids.

After soaking, the grids are lowered. The hearth discharges the extrusions into a spray quench chamber at 100 fpm. It floods the work with 20,000 gpm of water at 100 psi. Special heads on the charge end are adjustable to allow some control over the normal distortion of more intricate shapes.

Dow treats practically all varieties of aluminum extrusions in its furnace. Handling the 90-ft pieces horizontally, say Dow engineers, is a lot easier than trying to do it vertically.

Scarfer T. King puts his idea to work and shows how the wrench breaks with the roll of a heavy billet. Rigid-handled wrenches were a potential hazard

Wrench Disarms Billets

Hinged device provides greater safety for scarfers in conditioning yards. It was developed from idea suggested by a worker who was confronted daily by handling hazards

BOWED, humped, or curved billets are difficult and dangerous to handle. A 1440-lb piece of twisting metal can easily and unexpectedly tear a rigid wrench from a worker's hands.

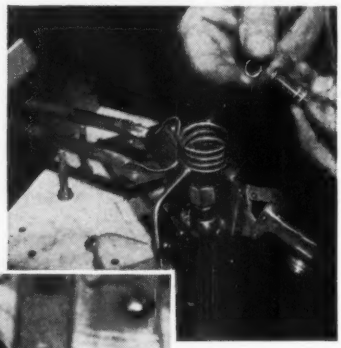
Terrel King, a scarfer in the conditioning yard at Colorado Fuel & Iron Corp., Pueblo, Colo., presented his idea for a better and safer wrench to Bill Cordsen of the firm's weld shop. They teamed up to develop a wrench that is rigid when a worker is turning a billet, breaks into hinged parts if the piece takes unpredictable turns.

Five of the wrenches are in use constantly at the yard. A sixth, offset to allow a worker to reach inside a span of billets to make the necessary turns, is on the way.

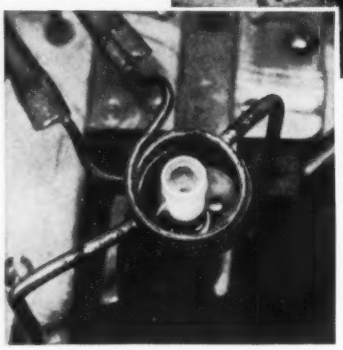
The improved design has figured strongly in the reduction of yard accidents.

B-1 Flux is particularly effective in removing refractory oxides such as those formed in stainless steels.

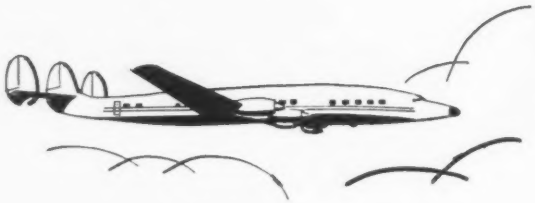
Operator fits preformed ring of BRAZE 541 prior to fluxing. This is a hose and tube assembly for an oil line.



Here operator applies gas-air torch, hand-feeding BRAZE 541 to joint.



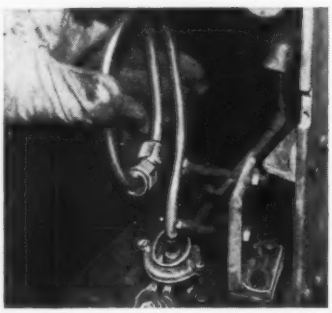
Oil-bearing unit under induction heating.



Here's How Stainless Steel Fuel Systems Benefit From

HANDY & HARMAN SILVER BRAZING

Tube Processing Corporation, Indianapolis, Indiana, makes aircraft and missile fuel systems and, if anything has to be more failure-proof than a fuel line assembly in an airplane, you name it. The units shown here are made of 410 stainless steel tube and 321 stainless steel fittings; when they're joined, they must be joined permanently. Exhaustive tests, including X-ray, pass on each assembly before final acceptance.



Operator placing oil line (of another type) in induction heating ring.

To meet all requirements: strength, ductility, liquid and airtightness, production speed and economy, Tube Processing uses Handy & Harman's special alloy BRAZE 541 (formerly Alloy 4772) and HANDY B-1 FLUX.

Developed strictly for brazing stainless, BRAZE 541 is one of many Handy & Harman brazing alloys—both standard and special—made to do a specific job and do it better than any other metal-joining method.

Name your product and the metals it's made of, the chances are very good indeed that one of Handy & Harman's silver brazing alloys can join it better than the method you now employ. Better from every aspect: economy, speed, strength, conductivity, labor savings. Put your product in these pictures for the same benefits.

An exclusive additional benefit is Handy & Harman's application Engineering Service. This is a service that exists to show you how these benefits can best be applied to your product. We invite you to take advantage of both Handy & Harman Brazing Alloys and Engineering Service.

GET THE FACTS

Technical Bulletins T-1 and T-2 give the general characteristics of silver brazing alloys plus the compositions, melt and flow points of 32 separate alloys. Write for your copies.

Your NO. 1 Source of Supply and Authority on Brazing Alloys

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MONTREAL, CANADA

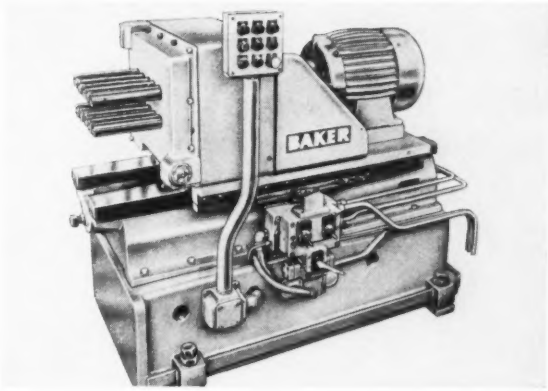
Machine Features Spindle Head Interchangeability

Drilling and tapping are done hydraulically on these machines. Vertical and horizontal models are offered. Each has capacities and interchangeable heads to meet nearly every production need.

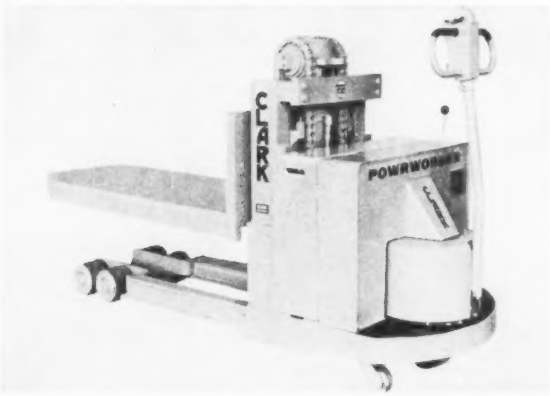
Design emphasis was placed on interchangeability. For the basic machines, there are 21 sizes of standard adjustable spindle heads.

Fixed center heads, with standard housings and gear trains, and custom bored spindle locations are available in about 27 models.

Bare horizontal units (shown) are available in way widths of 12, 18, and 24 in. Each is standard with 18, 27, and 40 in. strokes. Power index tables are offered to 60 in. in diameter. *Write*: Baker Brothers Inc., 1000 Post St., Toledo, Ohio. *Phone*: Cherry 4-9511



Battery-Operated Truck Handles 2-Ton Skids



A medium-lift Powrworker truck for lifting and hauling skids is battery operated. The standard unit will lift 4000 lb; a special 6000-lb capacity machine is available.

Direction is controlled by a butterfly switch on the steering handle. It is impossible to direct both forward and reverse current to the drive motor at the same time.

The brakes are automatically applied when the steering handle is in vertical or horizontal position, and it returns to vertical when released.

It has a lift speed of 12 fpm loaded. Lifting height is 21 in. The skid platform is 26 in. wide and is available in lengths from 36 to 60 in. (in 6 in. increments). *Write*: Industrial Truck Div., Clark Equipment Co., Battle Creek, Mich. *Phone*: Woodward 2-6561

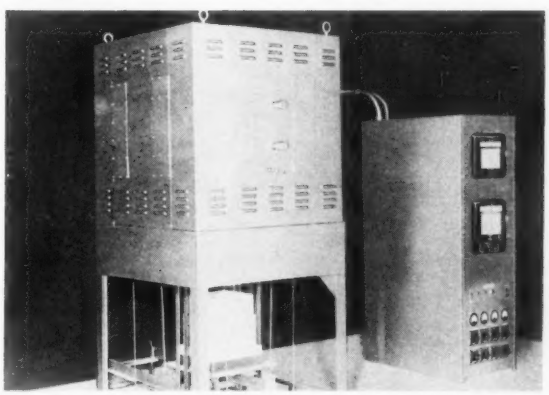
Furnace Holds Close Control with Sealed Firing Chamber

Model NMR-12-DEN electric furnace provides close control of atmospheres and temperatures. The housing is completely sealed to insure retention of the element in the firing chamber.

Lightly loaded nonmetallic resistor type units insure long life under hard service. The upper banks can be controlled independently by manual adjustment or separate instrumentation.

The elevator-type hearth is gently raised and lowered by a reversible motor drive.

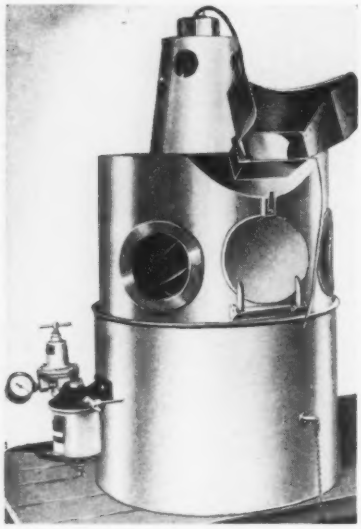
The furnace operates up to 2800° F and is available in all common voltages, single or three phase, 16 kw. *Write*: Harrop Electric Furnace Div., Harrop Ceramic Service Co., 3470 E. 5th Ave., Columbus 19, Ohio. *Phone*: Belmont 1-3621



NEW PRODUCTS and equipment

Honer Boosts Tool Life

The Liqui-Breez honer saves resharpening time, cuts machine



downtime and produces high-quality finish deburring.

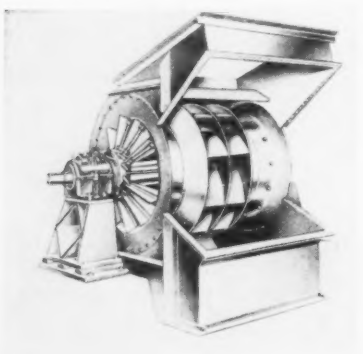
The maker says it will increase tool life by 300 to 400 per cent. It can be used for honing all types of tungsten carbide and HSS cutting tools and drills.

The machine has a self-contained cabinet, and comes with rubber gauntlets. A scope and shield permit direct view of the work. *Write*: Tobin-Arp Mfg. Co., 6400 Penn Ave. S., Minneapolis 23, Minn. *Phone*: Union 9-3217

Fan Has High Efficiency

These Airfoil 4000 Series fans are designed for mechanical draft and other heavy-duty applications.

The units may be used as forced draft devices for combustion air



supply with open inlets; with inlet boxes to handle preheated air, industrial process supply, and exhaust applications; and as induced draft fans for oil or gas firing.

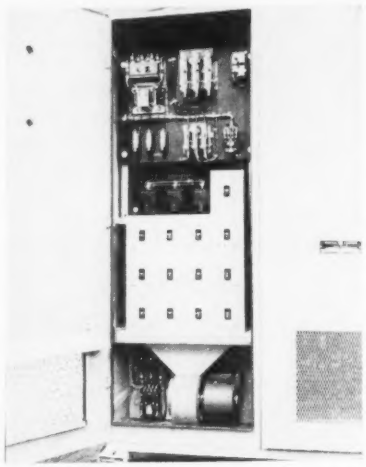
They are available in 15 sizes and have volumetric capacities from 10,000 to 700,000 cfm. *Write*: Dept. T-234 Sturtevant Div., Westinghouse Electric Corp., 200 Readville St., Hyde Park, Boston 36, Mass. *Phone*: Hyde Park 3-3700

Supplies Motor Power

Packaged, static, power supplies for direct current motor drives require little maintenance.

Applications are expected in metal rolling and processing industries as well as others where high reliability and reduced downtime are important. They may be used in place of motor-generators where nonreversing adjustable speed drives (without pumpback currents) are required.

Ratings extend to 300 kw. *Write*:



General Electric Co., Schenectady 5, N. Y. *Phone*: Franklin 4-2211

Welders Are Air Cooled

These drooping voltage arcwelders are available in three types — 250 amperes dc, 300 amperes ac/dc, and 300 amperes ac/dc Heliwelder.

All machines provide 115/230 volt, 10 kw, single phase, 60 cycle power when operated as powerplants.

These units are equipped with Hercules - Lycoming engines. Optional accessories include road trailers, canvas covers, and a water cir-

culating system. *Write*: Air Reduction Sales Co., 150 E. 42nd St., New York 17, N. Y. *Phone*: Murray Hill 2-6700

Gage Surfaces Don't Glare

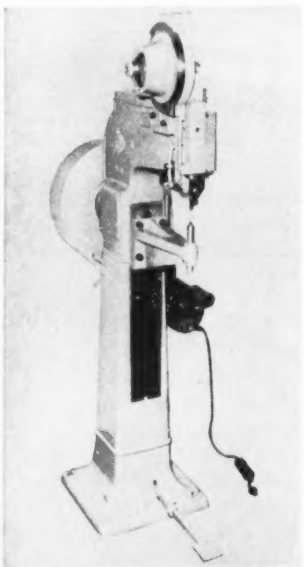
The No. 254 Master vernier height gage has many precision features to make layout and inspection work easier, faster, and more accurate.

It has a 50-division, flush fitting vernier and a sensitive, full length slide adjustment with quick adjusting screw release. Its satin chrome finish provides a no-glare surface.

The gage is available in 12, 18, and 24 in. sizes. *Write*: L. S. Starrett Co., Athol, Mass. *Phone*: Churchill 9-3551

Machine Sets Rivets

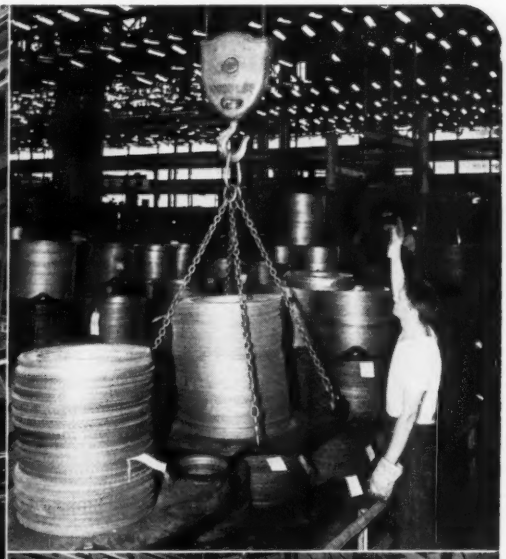
An automatic rivet setting machine handles all types of work.



CRANES *SPEED* PALLET-HANDLING

Store More—Eliminate Congestion—Cut Maintenance—Save Floors

Pallets loaded with motor stator laminations are easily lifted and moved with these floor-operated Tramrail cranes. Note that the entire area is jam-packed, with no lost aisle-way space. The ease with which any loaded pallet can be picked up and handled to awkward-to-reach places is a distinct advantage.



Pallets with 32 100-lb. kegs of nails are piled high in storage with the cab-operated Tramrail crane and open-side pallet lift.

THERE'S no height limit when stacking palleted materials with Tramrail cranes. 20 ft.—30 ft.—40 ft. or higher are easy. Your materials and building are the only limiting factors.

Often 50% and more materials on pallets can be stored in a room served by overhead cranes. Narrowing of some aisles, elimination of others, plus higher and closer piling make the difference.

Pallet loads are moved safely and speedily overhead where the path is always clear and unobstructed. Placing this handling job near the ceiling, reduces floor congestion and frees much of it for other purposes.

Maintenance costs for Tramrail cranes are extremely low, usually only a few percent of that for power-operated floor trucks. No engines to overhaul. No clutches to replace. No brakes to re-line. No batteries to charge. No irritating gas fumes. And of importance, extra heavily reinforced floors are not required and costly floor damage because of materials handling is eliminated.

When considering pallet handling or any materials handling, it will pay you to look into the tremendous advantages that Cleveland Tramrail cranes offer.

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CLEVELAND TRAMRAIL DIVISION
THE CLEVELAND CRANE & ENGINEERING CO.
7878 East 284th Street, Wickliffe, Ohio

CLEVELAND TRAMRAIL
OVERHEAD MATERIALS HANDLING EQUIPMENT

NEW PRODUCTS and equipment

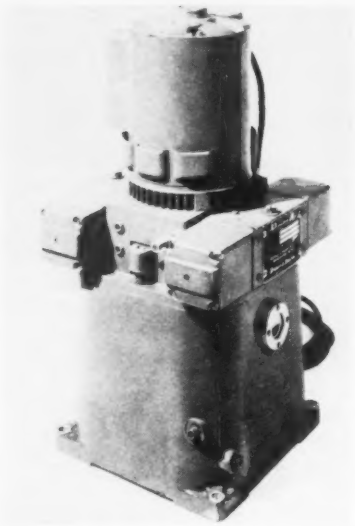
Anvils of all lengths are available, and the unit will accommodate rivet diameters from 3/32 to 3/16 in. and lengths up to 1 in. *Write*: Townsend Co., P. O. Box 237-Z, New Brighton, Pa.

Provides Hydraulic Power

The Circuitpak, a low cost hydraulic power unit, is manifold circuited for direct connection to cylinder lines.

Four pump capacities from 0.8 to 5 gpm are available with 1, 1½, or 2 hp capacitor-start motors and up to four solenoid-operated four-way valves.

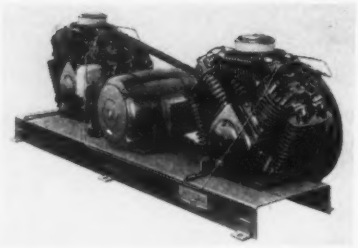
Operation is at 3600 rpm with pressures up to 1000 psi. Design is especially adaptable for conversion of production equipment to hydraulic automation. *Write*: Hydraulics Div., Brown & Sharpe Mfg. Co., Providence 1, R. I. *Phone*: Dexter 1-5000



Compressors Up Capacity

These double compressor units will displace from 96.4 to 129 cu ft of air a minute. They come in 20 and 25 hp and 125 and 175 psi ratings.

The units are equipped with pressure switches and magnetically controlled unloaders. A magnetic starter with selector switch for automatic start-stop operation or constant speed unloading is available,



also vertical air receivers for remote installation. *Write*: DeVilbiss Co., Toledo 1, Ohio. *Phone*: Garfield 4-5411

Silver Clad Strip

Cadmium-silver clad phosphor bronze strip is supplied in all types of cladding.

The overlay of cadmium-silver supplies excellent electrical contact properties and conductivity, while the phosphor bronze base has good spring properties for electrical contact springs. *Write*: American Silver Co. Inc., 36-07 Prince St., Flushing 54, N. Y. *Phone*: Flushing 3-8012

Forks Are Adjustable

The Booster Model L 1112-T portable lift will raise 1000-lb loads to 112 in. Fully adjustable hanging forks are standard equipment.

A built-in, selenium rectifier-type battery charger plugs into any 110-volt source. The unit is controlled by a hand lever that provides finger-tip control. *Write*: Portable Lift Div., Hartman Metal Fabricators Inc., 133 Murray St., Rochester 6, N. Y. *Phone*: Fairview 8-5990

NEW literature

Write directly to the company for a copy

Environmental Chambers

A detailed brochure describes this firm's environmental chambers for controlled atmospheric conditions. Included are specifications, technical data, and applications in metalworking and other fields. Webber Engineering Corp., P. O. Box 217, Indianapolis 6, Ind.

Investment Casting

A flyer tells when and why investment casting should be used in preference to other casting methods. Alloy Steel Casting Co., 107 County Line Rd., Southampton, Pa.

Self-Dumping Hoppers

A brochure describes a complete line of self-dumping hoppers designed for industrial truck handling. Apex Welding & Fabricating Corp., 30 Interstate St., Bedford, Ohio.

Flattened Wire

A technical folder gives specifications, engineering data, and availabilities of flattened aluminum wire. Applications include transformer windings, ornamental grillwork, zippers, and close tolerance mechanical parts for typewriters and computers. Dept. NR-15, Kaiser Aluminum & Chemical Sales Inc., 919 N. Michigan Ave., Chicago 11, Ill.

Crane Control

Two bulletins, No. 6100 for direct current and No. 6400 for alternating current, describe master switches, disconnects, limit switches, frequency relays, brakes, and other components. Electric Controller & Mfg. Co., division of Square D Co., 4500 Lee Rd., Cleveland 28, Ohio.

Slab and Bloom Marking

Remotely controlled slab and bloom marking is described in a brochure. Double-headed slab markers and consecutive numbering billet markers are included. M. E. Cunningham Co., 1038 Chateau St., Pittsburgh 33, Pa.

Safety Codes

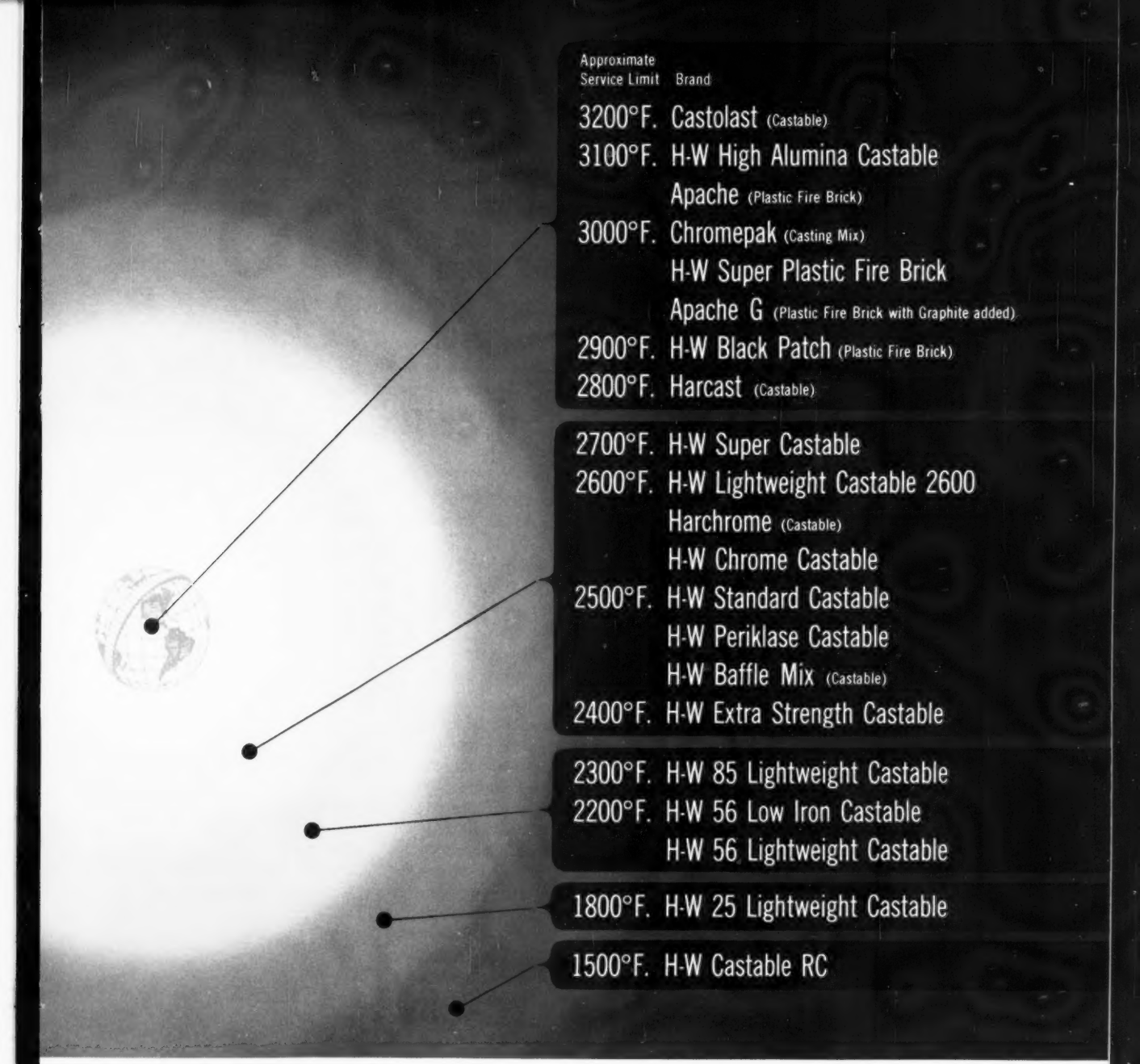
The *F.E.M.A. Handbook of Safety Codes* outlines the various procedures for maintaining, protecting, recharging, and inspecting fire extinguishing equipment commonly used throughout the metalworking industry. Fire Equipment Manufacturers' Association Inc., 1 Gateway Center, Pittsburgh 22, Pa.

Wrought Iron

4-D Wrought Iron, A New Dimension in Corrosion Control shows the comparative corrosion resistance of 4-D wrought iron, standard wrought iron, and other ferrous metals. A. M. Byers Co., P. O. Box 1076, Pittsburgh 30, Pa.

Portable Compressors

A folder covers various portable electric and gasoline compressors. Eclipse Air Brush Co., 390 Park Ave., Newark 7, N. J.


Approximate Service Limit Brand
3200°F. Castolast (Castable)
3100°F. H-W High Alumina Castable
Apache (Plastic Fire Brick)
3000°F. Chromepak (Casting Mix)
H-W Super Plastic Fire Brick
Apache G (Plastic Fire Brick with Graphite added)
2900°F. H-W Black Patch (Plastic Fire Brick)
2800°F. Harcast (Castable)
2700°F. H-W Super Castable
2600°F. H-W Lightweight Castable 2600
Harchrome (Castable)
H-W Chrome Castable
2500°F. H-W Standard Castable
H-W Periklase Castable
H-W Baffle Mix (Castable)
2400°F. H-W Extra Strength Castable
2300°F. H-W 85 Lightweight Castable
2200°F. H-W 56 Low Iron Castable
H-W 56 Lightweight Castable
1800°F. H-W 25 Lightweight Castable
1500°F. H-W Castable RC

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can assure the proper selection for maximum life and economy

In addition to the wide range of service temperature limits as here illustrated, these monolithic refractories possess the many different combinations of physical and chemical properties needed for best protection against widely diversified destructive factors. From these brands the best balanced selection can be made for adequately withstanding the most severe operating conditions. Some examples of the many destructive influences against which maximum resistance is needed, are: corrosion by slags, fuel ash and various other fluxes; thermal shock; disintegrating action of gases; erosion by molten metals and slags; mechanical stresses at the high working temperatures.

To help secure maximum service from these refractories, Harbison-Walker freely offers engineering service, recommendations based upon wide experience, and quality-controlled products.

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AND SUBSIDIARIES GENERAL OFFICES: PITTSBURGH 22, PA.
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Jones & Laughlin announces

JALCASE 100

improved high-strength, stress-stabilized, wear-resistant, cold drawn bar steel

Jalcase steels are no novelty—J&L has been producing ten cold-finished grades for years—but a free machining steel with the properties of Jalcase 100 *is* new. This improved steel has a higher level of wear-resisting hardness than previously available and a favorable balance of other desirable cost-reducing in-the-bar properties.

Three principal features of the new Jalcase 100 are:

1. A guaranteed minimum yield strength of 105,000 pounds per square inch (psi) in round bar sizes up to and including 1½-inch, 100,000 psi over 1½-inch through 3-inch, and 90,000 psi over 3-inch.
2. Guaranteed minimum hardness of 248 Brinnell in sizes up to 1½-inch inclusive and 241 Brinnell for larger sizes.
3. Stabilized residual stresses to reduce after-machining distortion problems.

Warpage problems requiring straightening after machining are minimized by the use of Jalcase 100. Balanced residual stresses have been achieved by an advanced cold drawing process.

The increased hardness of this new steel means dependable wear resistance for finished parts. In addition, while Jalcase 100 can readily be surface-hardened when necessary, its extra strength and hardness are sufficient to eliminate any need for subsequent heat treatment of parts for many applications. This can mean substantial savings.

The stabilized—or balanced—residual stresses of Jalcase 100 are especially important to automatic screw machine operators and others who need stable free machining bars with a maximum resistance to distortion after machining operations. Key slots in shafts, for example, need no longer be a major source of trouble.

Jalcase 100 has a chemical analysis equivalent to Jalcase 9 and 10 (AISI C-1144), and is a free-machining steel. In fact, one major user has already reported a machinability index of 82%, a rating relative to the low carbon free-cutting grade B-1112 at 100%.

J&L technical consultants are available to discuss the applicability of Jalcase 100 to your specific production needs. If you're interested in a more uniformly hard steel, with higher strengths and good machinability—and you wish to avoid the expense of additional heat treatments and problems of distortion—contact your J&L salesman or write to Dept. 404, Jones & Laughlin Steel Corporation, 3 Gateway Center, Pittsburgh 30, Pennsylvania.

Close size accuracy and exceptionally high wear resistance are assured when using Jalcase 100. Production costs can be cut substantially.

Jones & Laughlin Steel Corporation

PITTSBURGH, PENNSYLVANIA

Market Outlook

More Price Hikes Coming?

STEEL PRICES may soon be hiked another notch, structural fabricators believe. Base prices won't be changed, they predict, but extras may be boosted. Probable timing: January or February.

To protect itself on jobs requiring a firm bid, one company is adding $5 a ton to plates that will be delivered after the first of the year and $4.50 a ton to structurals. In estimating work to be completed after July, 1959, it assumes that prices will go up an additional $6 a ton.

"The steel companies raised extras during January in '56 and '57," a bridge builder points out. "They've been complaining that the August increases weren't big enough to offset higher costs."

TIN PLATE BOOSTED— Base prices on tin plate are going up on Nov. 1. U. S. Steel Corp. and its Tennessee Coal & Iron Div. will boost prices 35 cents per base box on electrolytic and hot dipped tin plate, black plate, and terne plate at Irvin and Fairless, Pa., Gary, Ind., and Fairfield, Ala. Columbia-Geneva Steel Div. will raise its prices 25 cents a box at Pittsburg, Calif. Other producers are expected to follow suit. Orders will probably soar next month as canmakers try to beat the deadline.

RECOVERY CONTINUES— New orders are running 10 to 15 per cent ahead of those booked during August, steelmakers report. Sheets are leading the field, thanks to increased activity in the automotive and appliance industries. Demand from manufacturers of light tanks and steel drums is also improving. Many producers are booked through October on cold-rolled sheets. Galvanized products are holding up better than expected because of continued strong demand from the construction industry, farmers, and furnace manufacturers.

PRODUCTION HOLDS AT '58 HIGH— Last week, steelmaking operations remained at 66.5 per cent of capacity, the highest level of the year. Production was about 1,795,000 net tons of steel for ingots and castings. At its Clairton (Pa.) Works, U. S. Steel relighted five of its 12 open hearths after a shutdown of several months. At Buffalo, Bethlehem Steel Co. reactivated two more furnaces. It's operating 19 of its 35 open hearths, producing more steel than it has at any time since last December.

BRIGHT STEEL— Predicts Arthur B. Homer, Bethlehem's president: Inventory reduction seems to have ended and a modest buildup is in prospect. Logan T. Johnston, executive vice president of Armco Steel Corp., agrees. Says he: "The balance has now shifted to the side of recovery—not enough to expect another boom in the near future, but certainly enough to make us all feel considerably better than we did six months ago."

He predicts that the industry will turn out 108 million ingot tons next year (vs. 85 million in 1958). All markets will share in the 1959 demand upturn, he believes. Among them: Automotive, construction, and appliance (all up 5 per cent); machinery and railroad (15 per cent); petroleum and container (4 to 5 per cent); agricultural (4 per cent).

BRIGHT STAINLESS— Automotive demand for stainless strip is on the upgrade, with the emphasis on fast delivery. "The car manufacturers still want us to carry inventories for them," a steelmaker complains. "Even though they've started production of their '59 models, they're continuing to buy on a hand-to-mouth basis." Orders from missile and aircraft builders are coming at a good rate. It's hoped they'll soon increase.

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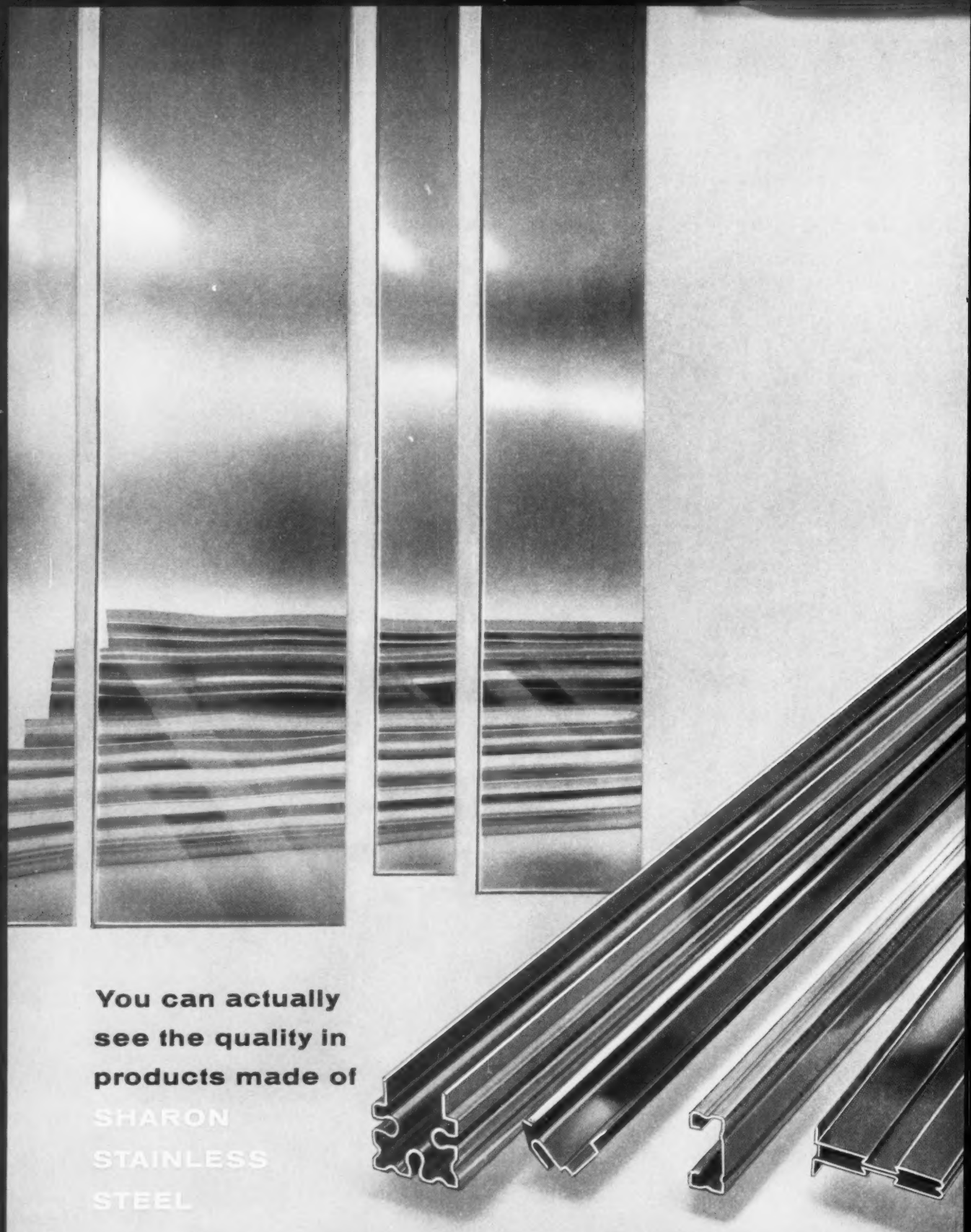


You can actually see the quality in products made of SHARON STAINLESS STEEL

SHARONSTEEL

SHARON STEEL CORP.

SHARON, PENNSYLVANIA

476

Silicon Sheets Hit Slump

Producers blame "false economy," inventory reductions, and cuts in utility expansion for two-year dip in deliveries. They predict moderate improvement in 1959

ELECTRICAL sheet shipments are in a downtrend. Manufacturers think they can cure most of their troubles, but this year's shipments still may be below those of the last eight years. There's little prospect that they'll surpass 450,000 tons.

Statistics of the American Iron & Steel Institute show shipments came to 222,991 tons in the first half, and the second half got off to a poor start: July shipments were only 21,861 tons.

Sales Are Sluggish—Producers of grain oriented silicon say demand from makers of power and distribution transformers is slack. Sellers of nonoriented grades complain that appliance demand is slow and shows only slight signs of an increase in the second half.

In 1953, shipments of 820,096 tons set a record which still stands. Production dipped in the last two years, despite a rise in electric power output. The decline surprised some observers, since the product plays a vital role in generators, dynamos, transformers, and motors. Silicon in the steel increases its electrical resistance, reducing core loss.

Grows with Electricity—In the late forties and early fifties, advances in sales rivaled or surpassed those of the electrical industry. Shipments jumped from 100,000 tons in the early thirties to 757,861 tons in 1951. Since that year, shipments have failed to match the electric power industry's growth rate. (Power production is doubling every ten years.)

Suppliers report sales are slow this year because:

1. Several producers of intermittently operating fractional horsepower motors are substituting cold-rolled sheets for silicon sheets. Sales of motor grades are down.

2. Home appliance producers worked off a double inventory in the first half. They had more sheets in stock than they needed, and they held an excess of unsold appliances containing silicon. Motor manufacturers and producers of distribution transformers faced an inventory problem, too.

3. Growth in popularity of transistors cuts use of silicon in the average radio.

4. Improvements in quality of the steel allow the same amount of sheets to do a bigger job. The trend is to fewer silicon laminations per unit in electrical motors.

5. Utilities shelved some expansion projects.

Sales managers think the substitution of cold-rolled sheets is a recession measure to cut costs at the expense of quality. Producers of fractional horsepower motors for appliances like fans and garbage disposal equipment have reduced use of silicon. So have makers of motors for automobile heaters.

Looking for Improvement—Suppliers expect moderate gains in the fourth quarter. Appliance sales are gaining. A major supplier of motor grades reports a modest increase in sales, indicating a possible reversal in the trend to substitution of cold-rolled sheets for silicon.

Further hopes for a gain in the final three months and in early 1959 rest on a reduction of customers' inventories. One producer says consumers' stocks dwindled from a 30-day average in the second quarter to a 20-day average in late third quarter. That firm adds: "Nonoriented silicon grades appear to be snapping out of their two-year decline as inventories drop."

Despite the dip in average use per unit of electrical equipment, sales managers think the rise in generating capacity will eventually bring an increase in demand. It may not push second half shipments above those of the first, but next year should see a gain of 5 to 10 per cent.

Trend in Shipments

(In Tons)

1958	450,000*
1957	618,863
1956	813,381
1955	791,043
1954	588,851
1953	820,096
1952	607,076
1951	757,861
1950	716,592
1949	379,180

*Estimated by STEEL.
Source: American Iron & Steel Institute.

Sheets, Strip . . .

Sheet & Strip Prices, Pages 126 & 127

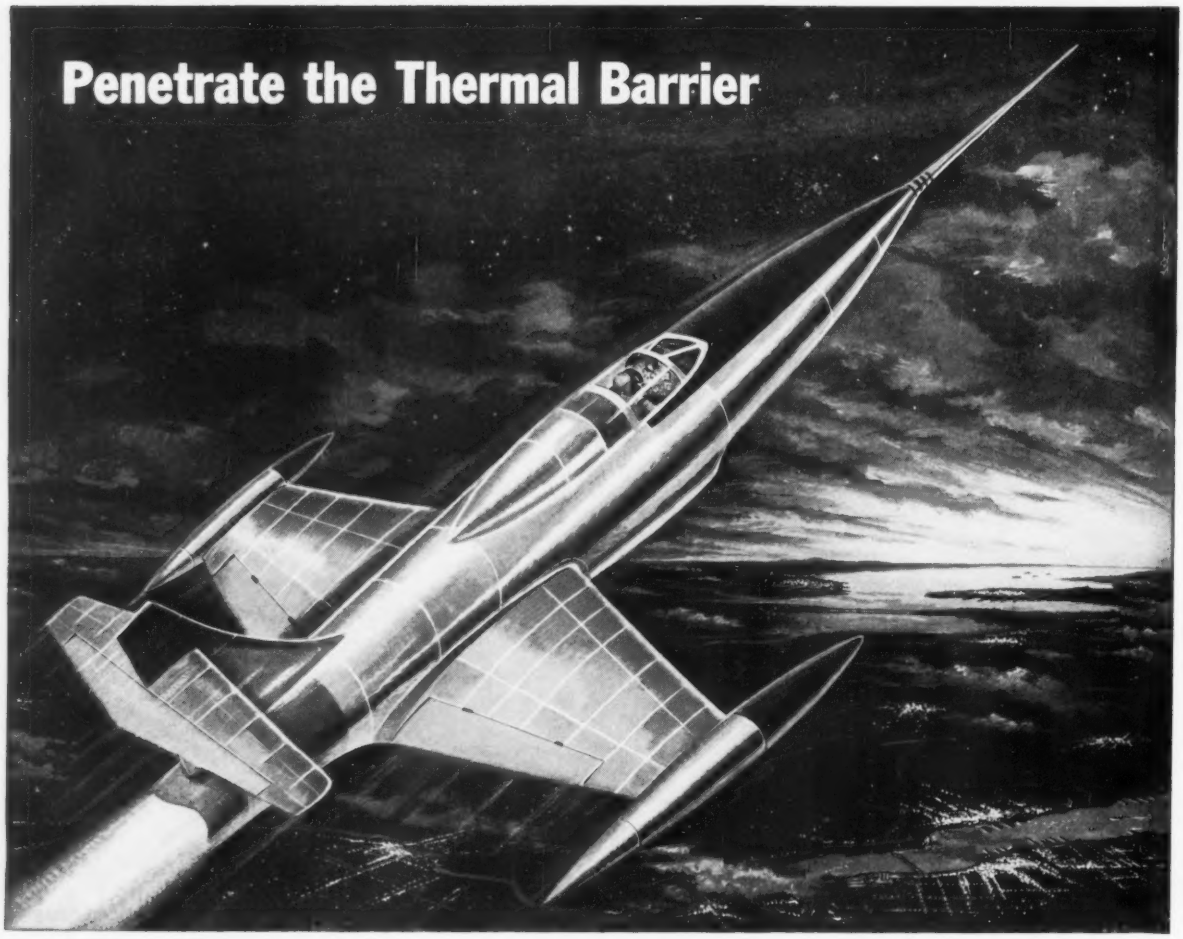
On the theory that there will be no major labor disturbance in the automotive industry this fall, sheet consumers, generally, are buying with more confidence, and they are building up inventories at a more substantial rate in anticipation of further tightening in supply.

Encouragement also stems from better demand from manufacturers of household appliances, light tanks, and steel drums. This affects specifications for hot and cold rolled sheets and specialties, such as electrical sheets, enameling stock, and certain grades of coated sheets.

Ahead of August—At Pittsburgh, district mills report slow but steady improvement in sales. Automakers are placing orders for November delivery, but they haven't committed themselves to big tonnages. Neither Chrysler nor General Motors wants to stock up on sheets until contracts are signed with the United Auto Workers.

"We're running about 10 per cent ahead of August on bookings," a Pittsburgh mill official said last week. "Orders from the appliance manufacturers reflect an upturn in retail sales of their products. In addition, miscellaneous buyers are coming back into the market to replenish low inventories."

Deliveries Lengthen — Shipment promises are gradually lengthening. Deliveries now range three to four weeks on hot-rolled sheets,



MicroMach extra-high-tensile stainless steel sheets up to 48" WIDE for aircraft and missile use

As the speed of today's aircraft rapidly approaches the Thermal Barrier, conventional metals are being left far behind in the race to satisfy the structural requirements of supersonic craft. Needed are metals that can withstand the intense heat caused by air friction at high speeds and still retain their strength. One such metal, MicroMach stainless, has been in use for more than a year.

MicroMach is a special aircraft and missile grade of modified type 301 stainless steel sheet furnished to higher mechanical properties than are available in other commercial high tensile grades in the full hard condition.

These sheets are rolled to extremely close tolerances (as low as plus or minus 3%) with micro-accuracy and precise uniformity of gauge. The surface of MicroMach sheet is smooth, clean and dense; qualities so important in minimizing surface friction.

For further information write to Aircraft Steels Dept

Washington Steel *Corporation*
9-0 WOODLAND AVENUE
WASHINGTON, PA.

MicroRold stainless steel is also available in all popular grades and to meet regular government specifications. Sheets up to 36" wide can be had as thin as .005", and over 36" to 48" wide as thin as .010" in all commercial finishes and tempers.

about six weeks on both cold rolled and galvanized sheets, while electrical sheets take four to six weeks.

Tubular Goods . . .

Tubular Goods Prices, Page 131

The outlook for oil country goods is improved, though sellers do not anticipate anything like last year's volume. Buyers are insisting on prompt shipments, indicating they are operating on low inventories.

The Texas Railroad Commission will apply the brakes on October oil production. Keyed to an 11-day output pattern, the commission set the daily allowable at 2,957,936 barrels, a reduction of 246,555.

Stainless Steel . . .

Stainless Steel Prices, Page 131

"The automotive companies still want us to carry inventories for them," says a stainless strip producer in the Pittsburgh district. "Even though they've started production of their 1959 models, they're continuing to buy hand to mouth. One of our customers told us that he'd have to have immediate delivery of some strip that was ordered for October."

Although it scored a 35 per cent gain in shipments during August, another producer has had little to cheer about since. "It looks like we won't do any better this month than last," a sales executive said last week. "And judging from what we've booked for October, we'll do well to match September's entries. Shipments are still running behind year-ago figures."

Distributors . . .

Prices, Page 132

Steel service centers report a slight pickup in business, but bookings are short of expectations of a month ago. Demand by products is normal but spotty as to territories and classes of industries.

Distributors' stocks are substantial and well rounded, although orders are being placed with mills a little more freely.

Higher prices which were posted recently have held firm in most instances in the Southwest.

W. M. Pattison Supply Co., Cleveland, has been named a distributor for Carmet, the carbide cutting tools of **Allegheny Ludlum Steel Corp.**, Pittsburgh.

Universal Steel Co., Cleveland, has been appointed a distributor for aluminum produced by **Olin Mathieson Chemical Corp.**, New York. Universal has facilities for slitting, roller-leveling, square shearing, and sawing. The Olin aluminum rolling mill, between Clarington and Hannibal, Ohio, is scheduled for full-scale operation by yearend. Olin produces extrusions in a plant at Gulfport, Miss.; all-aluminum and steel-reinforced aluminum electrical conductors at Chattanooga, Tenn.; and aluminum products for the western market at Riverside, Calif.

Wire . . .

Wire Prices, Pages 127 & 128

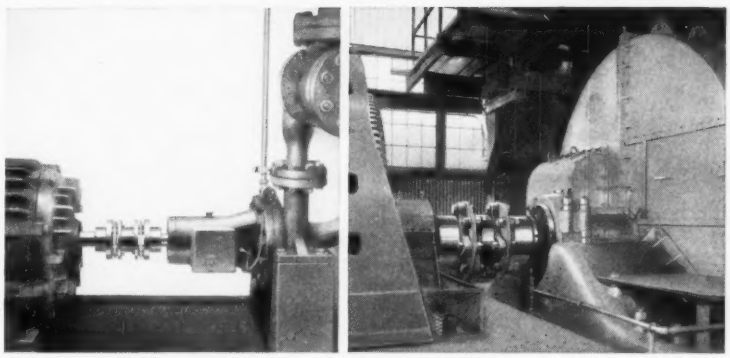
Improved prospects for labor peace in the automotive industry are stimulating demand for various grades of manufacturers' wire. But merchant wire requirements are expected to slacken seasonally, including items used in highway and other construction.

Adjustments continue to be made in wire price schedules. Last week, Detroit Steel Corp. announced it was restoring its former price of $12.65 per 100 lb on ACSR core

(*Please turn to Page* 121)

Protect your PUMPS and other Indispensable MACHINERY with

THOMAS FLEXIBLE COUPLINGS



NO LUBRICATION — NO MAINTENANCE — NO WEARING PARTS

Future maintenance costs and shutdowns are eliminated when you install Thomas Flexible Couplings. These all-metal couplings are open for inspection while running.

They will protect your equipment and extend the life of your machines.

Properly installed and operated within rated conditions, Thomas Flexible Couplings should last a lifetime.

UNDER LOAD and MISALIGNMENT ONLY THOMAS FLEXIBLE COUPLINGS OFFER ALL THESE ADVANTAGES:

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- Torsional Rigidity
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- Visual Inspection While in Operation
- Original Balance for Life
- No Lubrication
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- No Maintenance

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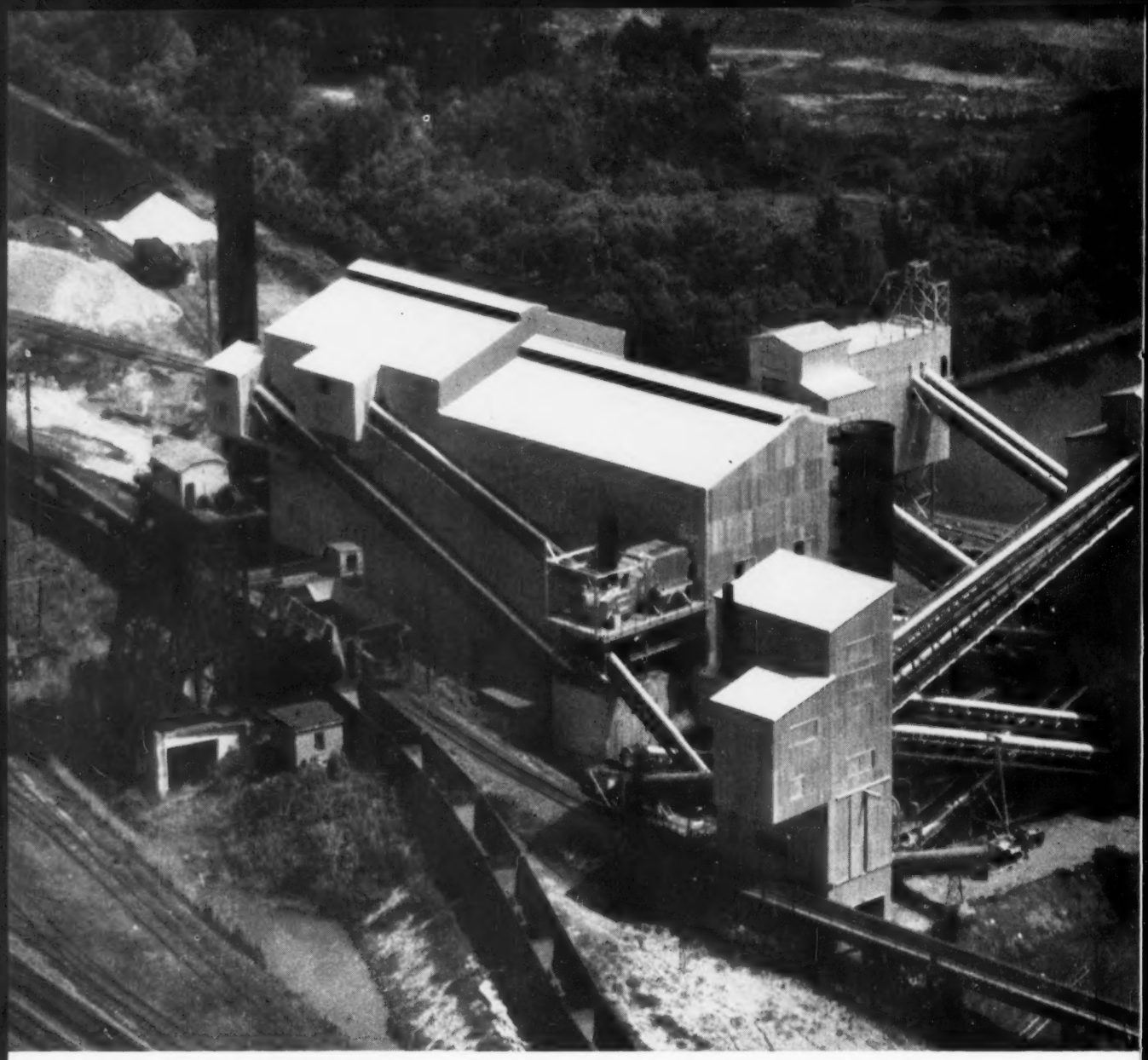
THOMAS FLEXIBLE COUPLING COMPANY

WARREN, PENNSYLVANIA, U.S.A.

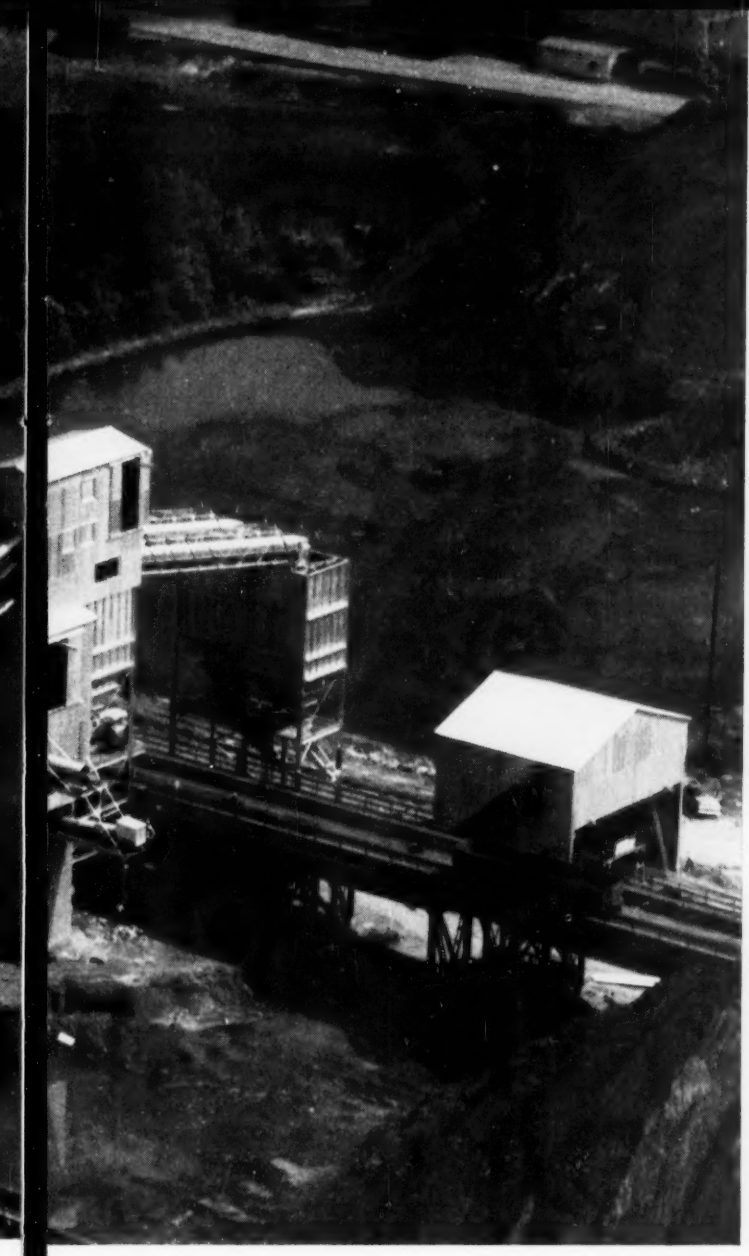


New 2400 tpd Sinter Plant

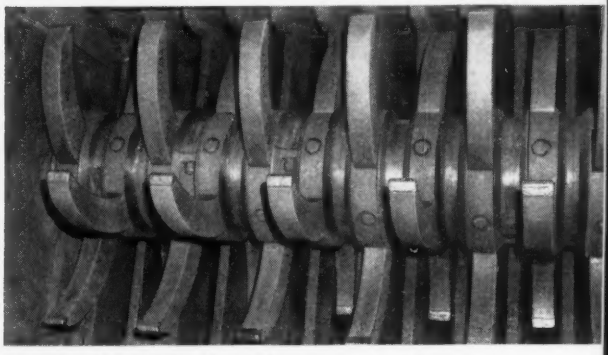
This Armco Steel Corporation installation at Ashland, Kentucky, is the first of several Dravo-Lurgi sintering plants to be completed. The new plant will make it possible to reclaim accumulated stores of sludge and flue dust, and will increase the efficiency of the blast furnace operation.

Built to fit into extremely limited space, the plant will receive and store a day's supply of raw materials in eight hours. The actual sinter machine has a maximum bed depth of 13½ inches and an active hearth area of 807 square feet. The pallets are 8 feet 3 inches wide and travel at a top speed of 17½ feet per minute.

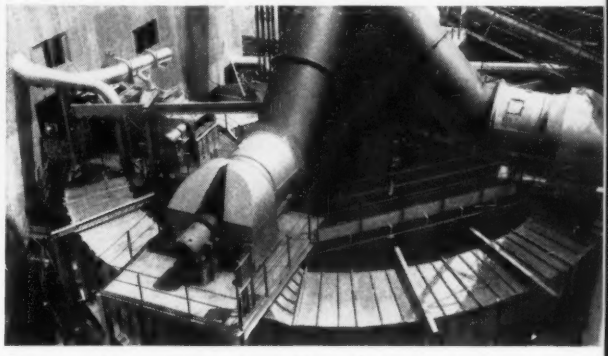
For details on how Dravo-Lurgi design



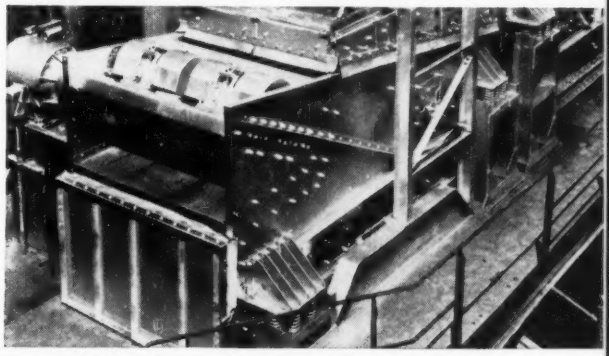
The Dravo-Lurgi sinter machine at Armco is also designed to sinter Labrador ore fines. Ignition is accomplished in 30 seconds by means of a large number of burners. Careful grading of burner sizes assures uniform ignition.



Specially designed breaker is long wearing and easily maintained. Arms are tipped with a tungsten carbide composition for long wear. Sinter cake is broken up with minimum production of fines.



Circular cooler uses large volume of low velocity air which lowers temperatures to approximately 200F at discharge end. Has no plows or scrapers, no water quenching—sinter breakup is held to minimum during cooling.



Dravo-Schenck screens and conveyors unload sinter into cooler, removing fines which could retard cooling. These screens and conveyors are designed for the economical handling of hot and abrasive materials.

in operation

and construction facilities can help you increase blast furnace production and reduce blast furnace costs, write DRAVO CORPORATION, PITTSBURGH 22, PA.

DRAVO

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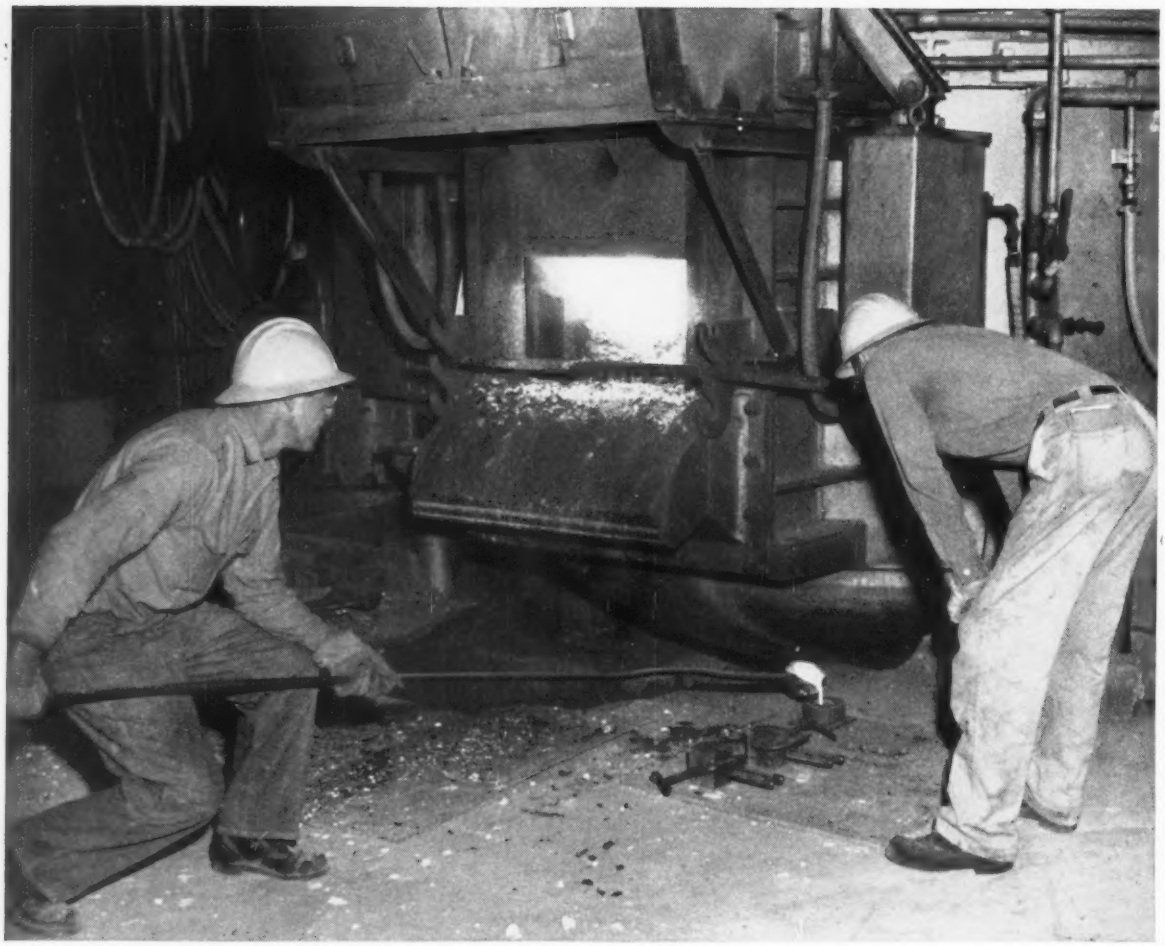

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BALDWIN BLH LIMA-HAMILTON

(*Concluded from Page* 117)
wire, effective Sept. 22. It had been quoting $15 a ton higher since Aug. 28. V. R. Bates, sales vice president, attributes the cancellation of the increase to growing competition from foreign material.

Complaints about competition from imported material are also heard in the Southwest—especially wire products and reinforcing steel. But one importer in the area hints that higher prices on foreign steel are in the making.

Rails, Cars . . .

Track Material Prices, Page 128

Domestic freight car orders in August totaled 1773 units, up noticeably from the 376 placed during July, reports the American Railway Car Institute and the Association of American Railroads. In August, 1957, orders involved 2928 units.

August deliveries amounted to 2151 freight cars, against 2113 in July, and 8758 in August last year.

Order backlogs as of Sept. 1 amounted to 25,611 cars, vs. 25,994 on Aug. 1, and 79,258 a year ago.

Plates . . .

Plate Prices, Page 125

Of all the major products, plates appear to least reflect the better over-all tone of the steel market. Requirements for building construction and shipwork are best sustained. Railroad demand is lagging, and industrial machinery and tank requirements are spotty.

Plate deliveries show no marked improvement. In the carbon grades, sheared plates are still available in two to three weeks, strip-plates in three weeks, and universal plates in a week to ten days. Floor plates are available in two weeks, and shipments of alloy plates are easier than they were a month ago.

In the Southwest, demand for plates still commands the most attention. A district producer is reported to have turned away some October business because of a full order book for that month. At Los Angeles, producers are closing their September books with open tonnage.

The Claymont, Del., mill of the Colorado Fuel & Iron Corp. has rolled its first nickel alloy steel plate. It is a 3½ per cent nickel, meeting specification ASTM A-203 Grade E. Claymont has produced this material in the fully heat treated condition, and has performed tests for impact values in accordance with specification ASTM-300 Class 3.

Tin Plate . . .

Tin Plate Prices, Page 127

Tin plate prices will be increased 3½ per cent on Nov. 1 by U. S. Steel Corp. and its operating subsidiaries, Tennessee Coal & Iron and Columbia-Geneva Steel. This extends price action that started last July to the last big tonnage products. Other makers are expected to announce similar prices, and indications are that canmakers will pass along the increase to their customers.

The new schedule advances electrolytic and hot dipped tin plate, black plate, and terne plate 35 cents a base box at Gary (Ind.), Irvin and Fairless (Pa.), and Fairfield (Ala.); Columbia-Geneva raised its prices 25 cents a base box at Pittsburg (Calif.). The new prices are: Irvin, Pa. and Gary, Ind., $9.10; Fairless, Pa., and Fairfield, Ala., $9.20; Pittsburg, Calif., $9.75.

Adjustments were also made (up and down) in certain tin mill extras and deductions. Prices on other miscellaneous tin mill products will also be revised.

Steel Bars . . .

Bar Prices, Page 125

Business in the commercial steel bar market is improved, but it could be better.

"September will be close to our best month of the year," says a supplier of hot bars at Pittsburgh. "The pickup hasn't been limited to the automotive industry. Almost all our customers are buying to replace depleted inventories. Even the cold drawers are coming into the market for bigger tonages, and they've been heavily stocked all year. Orders from the agricultural implement makers remain strong. Railroad orders are as weak as ever."

Having chalked up a 30 per cent gain in bookings during August another Pittsburgh mill expects its orders to spurt to an additional 15 to 20 per cent during this month.

While there have been some gains in demand for hot bars in the East—some makers running at capacity on the smaller sizes—the over-all improvement is not as spirited as had been expected. The steel service centers have not stepped up thier requirements to any marked extent, and specifications of fastener makers are only moderately heavier. The railroads aren't in the market.

But the automotive outlook is encouraging, with the probability that major labor disturbances will be avoided. Farm equipment has done pretty well this year, and prospects for 1959 continue promising. Manufacturers of heavy road building machinery are doing better. Their activity is reflected in better orders for bars and other products over recent weeks.

International Harvester Co. plans the construction of a merchant mill at its Wisconsin Steel Works, South Chicago, Ill. It will cost $12 million and require two and a half years to construct. To be known as No. 6 mill, it will roll small rounds, squares, flats,

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COMMERCIAL 98.6%

channels, and angles, and will have a capacity of about 20,000 tons a month.

Rectifier Prices Cut

Prices of Fansteel type 2A silicon rectifiers have been reduced about 30 per cent. This type unit is rated for a continuous output of 300 milliamperes. It is manufactured in eight voltage ratings, from 50 to 400 maximum peak reverse volts.

Pig Iron . . .

Pig Iron Prices, Page 132

While demand for pig iron this month is not up to earlier expectations, it is a shade more active than it was. Although there has been no buying for stock, consumers find it necessary to increase purchases to meet larger consumption requirements.

Some foundries which recently were operating only three or four days a week have extended their schedules to five days. Foundry business is still far from brisk, but it is improving.

With steelmaking operations rising, there are good prospects for increased pig iron production.

Limited steelmaking and pig iron production will be resumed at the Ensley (Ala.) Works of U. S. Steel's Tennessee Coal & Iron Div. about Sept. 28 .

Ferroalloys . . .

Ferroalloy Prices, Page 134

Electro Metallurgical Co., division of Union Carbide Corp., New York, recently announced price revisions for silicon metal, magnesium-ferrosilicon, ferro-manganese-silicon, all grades of ferrosilicon, and certain ferrochrome alloys. The new prices, effective Oct. 1, follow:

Low-chromium high-carbon ferrochrome, $0.2825; charge chrome, regular grade, $0.2575; refined charge chrome, $0.2650; foundry ferrochrome, $0.3080; "Chromtemp" No. 5, $0.2525; "Chrometemp" No. 8, $0.3175; "Chromtemp" No. 12, $0.3125; exothermic silicon-chrome, $0.4300; ferrochrome-silicon, 34-46 grade, $0.2825 (plus 0.1460 per pound Si); ferrochrome-silicon, 40-43 grade, $0.2825 (plus 0.1460 per pound Si); ferrochrome-silicon, 48-32 grade, $0.3025 (plus 0.1460 per pound Si); ferrochrome-silicon, 55-24 grade, $0.3225 (plus 0.1460 per pound Si). All prices given are per pound of chromium contained in the alloy except as indicated.

Silicon product prices are: Silicon briquets, $0.0800 (per pound briquets); 50 per cent ferrosilicon, regular grade, $0.1460; 50 per cent ferrosilicon, low-aluminum grade, $0.1605; 65 per cent ferrosilicon, regular grade, $0.1575; 65 per cent ferrosilicon, low-impurity grade, $0.1715; 75 per cent ferrosilicon, regular grade, $0.1690; 75 per cent ferrosilicon, low-aluminum grade, $0.1840; 85 per cent ferrosilicon, regular grade, $0.1860; 85 per cent ferrosilicon, low-aluminum grade, $0.1965; 85 per cent ferrosilicon, calcium-bearing low-aluminum grade, $0.2080; 90 per cent ferrosilicon, regular grade, $0.2000; 90 per cent ferrosilicon, low-aluminum grade, $0.2100; silicon metal, 0.50 per cent max Fe grade, $0.2200; silicon metal, 1.00 per cent max Fe grade, $0.2150; magnesium ferrosilicon, regular grade, $0.2050 (per pound alloy); magnesium ferrosilicon, $0.5050 cerium-bearing grade, $0.2350 (per pound alloy); magnesium ferrosilicon, 2.00 per cent cerium-bearing grade, $0.4150 (per pound alloy).

Ferromanganese-silicon is priced $0.1600 (per pound alloy).

Blast Furnace Output up

Blast furnace production (pig iron, ferromanganese, and spiegeleisen) totaled 4,799,955 net tons in August, reports the American Iron & Steel Institute.

Of the total, 31,374 tons were ferromanganese and spiegeleisen.

In the preceding month output was 4,304,183 tons (26,668 tons ferroalloys); in August, 1957, production was 6,781,751 tons, of which 61,988 tons were ferroalloys.

Production by state for August and in the first eight months:

BLAST FURNACE PRODUCTION—AUGUST, 1958
(Net tons)

State:	August	First 8 Months
Massachusetts, New York	431,003	2,311,527
Pennsylvania	1,164,218	9,154,127
Maryland, Virginia, West Virginia	341,688	3,773,026
Kentucky, Tennessee, Texas	145,552	1,009,578
Alabama	244,755	2,160,742
Ohio	840,183	5,502,257
Indiana	696,864	4,686,459
Illinois	328,089	2,306,499
Michigan, Minnesota	333,660	1,781,912
Colorado, Utah, California	273,943	2,123,017
Total	4,799,955*	34,809,144**

*Includes 31,374 tons of ferromanganese and spiegeleisen.
**Includes 310,365 tons of ferromanganese and spiegeleisen.
Data from the American Iron & Steel Institute, New York.

DISTRICT INGOT RATES

(Percentage of Capacity Engaged)

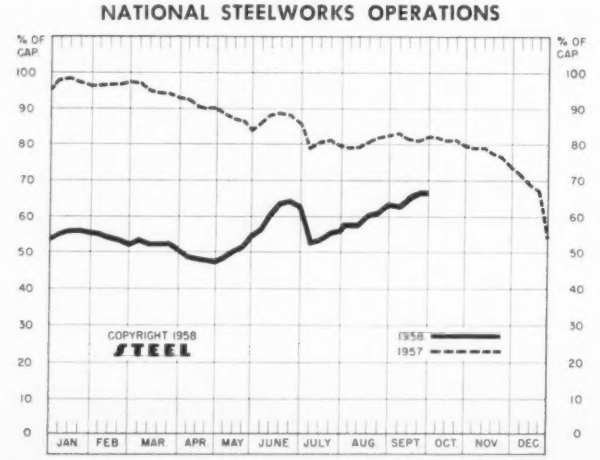
	Week Ended Sept. 28	Change	Same 1957	Week 1956
Pittsburgh	62	+ 1*	83.5	101.5
Chicago	76.5	0*	86	101.5
Eastern	66	+ 2	86	99.5
Youngstown	54	— 5	77	102
Wheeling	73.5	+ 4	94	101
Cleveland	68	+10.5*	85.5	106
Buffalo	58.5	+ 5	100	107.5
Birmingham	54	0	72.5	97.5
Cincinnati	73.5	0*	79	86
St. Louis	78.5	+ 0.5	77	96.5
Detroit	56	—11.5*	94.5	98
Western	75	+ 1	94	99
National Rate	66.5	0	82	100.5

INGOT PRODUCTION‡

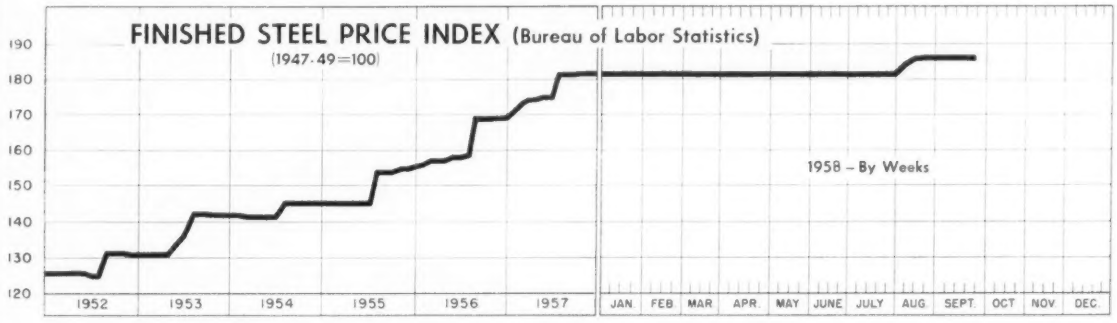
	Week Ended Sept. 28	Week Ago	Month Ago	Year Ago
INDEX (1947-49 = 100)	111.6†	110.2	106.8	131.0
NET TONS (In thousands)	1,793†	1,771	1,715	2,105

*Change from preceding week's revised rate. †Estimated. ‡American Iron & Steel Institute. Weekly capacity (net tons): 2,699,173 in 1958; 2,559,490 in 1957; 2,461,893 in 1956.

NATIONAL STEELWORKS OPERATIONS



Price Indexes and Composites



Sept. 23, 1958	Week Ago	Month Ago	Sept. Avg	Year Ago
186.6	186.6	186.4	186.6	181.5

AVERAGE PRICES OF STEEL (Bureau of Labor Statistics)

Week Ended Sept. 23

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parentheses. For complete description of the following products and extras and deductions applicable to them, write to STEEL.

Rails, Standard No. 1	$5.825	Bars, Reinforcing	6.385
Rails, Light, 40 lb	7.292	Bars, C.F., Carbon	10.710
Tie Plates	6.783	Bars, C.F., Alloy	14.125
Axles, Railway	10.175	Bars, C.F., Stainless, 302 (lb)	0.553
Wheels, Freight Car, 33 in. (per wheel)	62.000	Sheets, H.R., Carbon	6.350
Plates, Carbon	6.350	Sheets, C.R., Carbon	7.300
Structural Shapes	6.167	Sheets, Galvanized	8.545
Bars, Tool Steel, Carbon (lb)	0.560	Sheets, C.R., Stainless, 302 (lb)	0.688
Bars, Tool Steel, Alloy, Oil Hardening Die (lb)	0.680	Sheets, Electrical	12.625
Bars, Tool Steel, H.R., Alloy, High Speed, W 6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.060 (lb)	1.400	Strip, C.R., Carbon	9.489
Bars, Tool Steel, H.R., Alloy, High Speed, W18, Cr 4, V 1 (lb)	1.895	Strip, C.R., Stainless, 430 (lb)	0.493
Bars, H.R., Alloy	10.775	Strip, H.R., Carbon	6.250
Bars, H.R., Stainless, 303 (lb)	0.525	Pipe, Black, Buttweld (100 ft)	20.525
Bars, H.R., Carbon	6.675	Pipe, Galv., Buttweld (100 ft)	23.975
		Pipe, Line (100 ft)	205.710
		Casing, Oil Well, Carbon (100 ft)	201.080
		Casing, Oil Well, Alloy (100 ft)	315.213
		Tubes, Boiler (100 ft)	51.200
		Tubing, Mechanical, Carbon (100 ft)	26.157
		Tubing, Mechanical, Stainless, 304 (100 ft)	205.608
		Tin Plate, Hot-dipped, 1.25 lb (95 lb base box)	9.783
		Tin Plate, Electrolytic, 0.25 lb (95 lb base box)	8.483
		Black Plate, Canmaking Quality (95 lb base box)	7.583
		Wire, Drawn, Carbon	10.575
		Wire, Drawn, Stainless, 430 (lb)	0.653
		Bale Ties (bundles)	7.967
		Nails, Wire, 8d Common	9.828
		Wire, Barbed (80-rod spool)	8.719
		Woven Wire Fence (20-rod roll)	21.737

STEEL's FINISHED STEEL PRICE INDEX*

	Sept. 24 1958	Week Ago	Month Ago	Year Ago	5 Yr Ago
Index (1935-39 avg=100)	246.65	246.65	246.65	239.15	189.38
Index in cents per lb	6.682	6.682	6.682	6.479	5.130

STEEL's ARITHMETICAL PRICE COMPOSITES*

Finished Steel, NT	$149.28	$149.28	$149.28	$146.19	$115.56
No. 2 Fdry Pig Iron, GT	66.49	66.49	66.49	66.49	56.54
Basic Pig Iron, GT	65.99	65.99	65.99	65.99	56.04
Malleable Pig Iron, GT	67.27	67.27	67.27	67.27	57.27
Steelmaking Scrap, GT	43.00	43.00	41.67	46.33	36.50

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130.

Comparison of Prices

Comparative prices by districts in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED STEEL	Sept. 24 1958	Week Ago	Month Ago	Year Ago	5 Yr Ago
Bars, H.R., Pittsburgh	5.675	5.675	5.675	5.425	4.15
Bars, H.R., Chicago	5.675	5.675	5.675	5.425	4.15
Bars, H.R., deld. Philadelphia	5.975	5.975	5.975	5.725	5.302
Bars, C.F., Pittsburgh	7.65*	7.65*	7.65*	7.30*	5.20
Shapes, Std., Pittsburgh	5.50	5.50	5.50	5.275	4.10
Shapes, Std., Chicago	5.50	5.50	5.50	5.275	4.10
Shapes, deld., Philadelphia	5.77	5.77	5.77	5.545	4.38
Plates, Pittsburgh	5.30	5.30	5.30	5.10	4.10
Plates, Chicago	5.30	5.30	5.30	5.10	4.10
Plates, Coatesville, Pa.	5.30	5.30	5.30	5.50	4.35
Plates, Sparrows Point, Md.	5.30	5.30	5.30	5.10	4.10
Plates, Claymont, Del.	5.30	5.30	5.30	5.70	4.55
Sheets, H.R., Pittsburgh	5.10	5.10	5.10	4.925	3.925
Sheets, H.R., Chicago	5.10	5.10	5.10	4.925	3.925
Sheets, C.R., Pittsburgh	6.275	6.275	6.275	6.05	4.775
Sheets, C.R., Chicago	6.275	6.275	6.275	6.05	4.775
Sheets, C.R., Detroit	6.275	6.275	6.275	6.05-6.15	4.975
Sheets, Galv., Pittsburgh	6.875	6.875	6.875	6.60	5.275
Strip, H.R., Pittsburgh	5.10	5.10	5.10	4.925	3.975-4.425
Strip, H.R., Chicago	5.10	5.10	5.10	4.925	3.925
Strip, C.R., Pittsburgh	7.425	7.425	7.425	7.15	5.45-5.95
Strip, C.R., Chicago	7.425	7.425	7.425	7.15	5.70
Strip, C.R., Detroit	7.425	7.425	7.425	7.25	5.45-6.05
Wire, Basic, Pittsburgh	8.00	8.00	8.00	7.65	5.475-5.525
Nails, Wire, Pittsburgh	8.95	8.95	8.95	8.95	6.35-6.55
Tin plate (1.50 lb)box,Pitts.	$10.30	$10.30	$10.30	$10.30	$8.95

*Including 0.35c for special quality.

SEMIFINISHED STEEL					
Billets, forging, Pitts. (NT)	$99.50	$99.50	$99.50	$96.00	$75.50
Wire rods ⅜-⅝" Pitts.	6.40	6.40	6.40	6.15	4.525

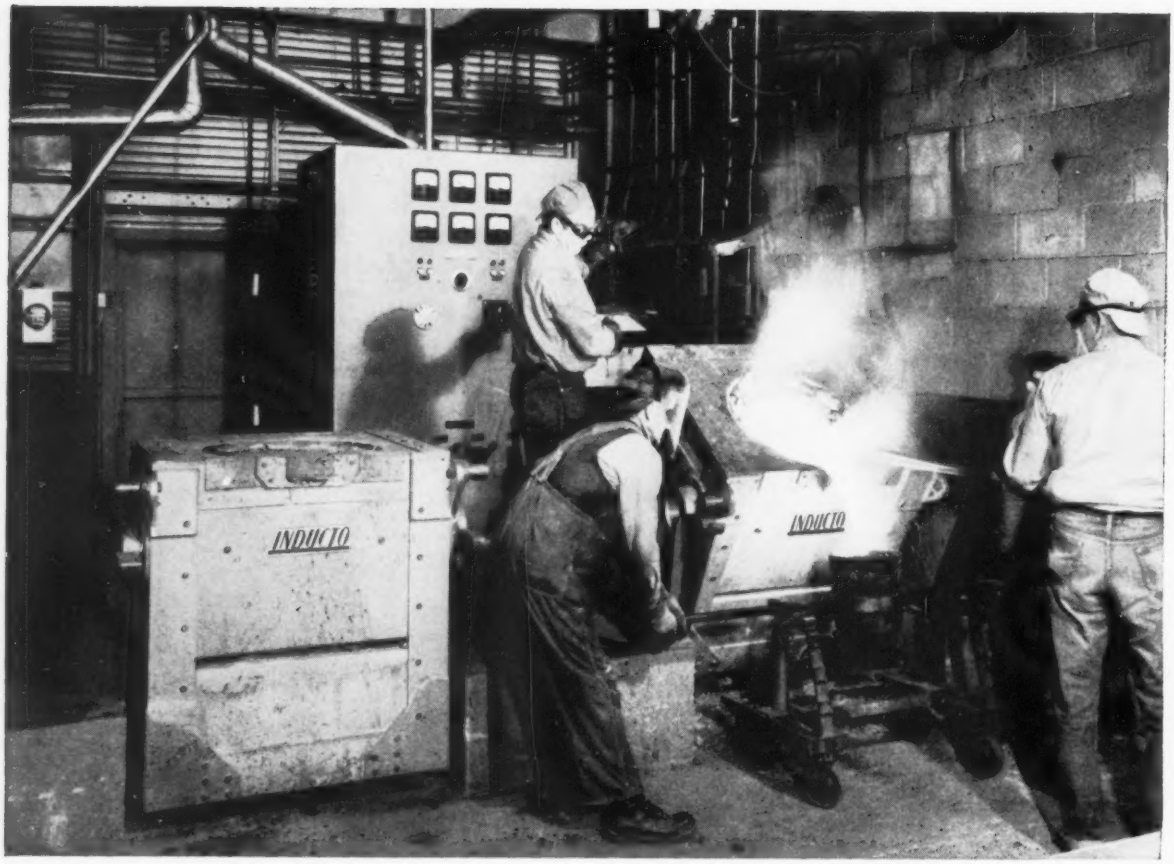
PIG IRON, Gross Ton	Sept. 24 1958	Week Ago	Month Ago	Year Ago	5 Yr Ago
Bessemer, Pitts.	$67.00	$67.00	$67.00	$67.00	$57.00
Basic, Valley	66.00	66.00	66.00	66.00	56.00
Basic, deld., Phila.	70.41	70.41	70.41	70.01	60.75
No. 2 Fdry,Neville Island,Pa.	66.50	66.50	66.50	66.50	56.50
No. 2 Fdry, Chicago	66.50	66.50	66.50	66.50	56.50
No. 2 Fdry, deld., Phila.	70.91	70.91	70.91	70.51	61.25
No. 2 Fdry, Birm.	62.50	62.50	62.50	62.50	52.88
No. 2 Fdry(Birm.)deld. Cin	70.20	70.20	70.20	70.20	60.43
Malleable, Valley	66.50	66.50	66.50	66.50	56.50
Malleable, Chicago	66.50	66.50	66.50	66.50	56.50
Ferromanganese, net ton	245.00†	245.00†	245.00†	255.00†	200.00*

†74-76% Mn, Duquesne, Pa. *Etna, Pa.

SCRAP, Gross Ton (Including broker's commission)					
No. 1 Heavy Melt, Pittsburgh	$43.50	$43.50	$42.50	$48.50	$39.50
No. 1 Heavy Melt, E. Pa.	40.00	40.00	39.00	43.00	34.50
No. 1 Heavy Melt, Chicago	45.50	45.50	43.50	47.50	35.50
No. 1 Heavy Melt, Valley	43.50	43.50	43.50	43.50	36.50
No. 1 Heavy Melt, Cleve.	40.00	40.00	40.00	39.50	32.50
No. 1 Heavy Melt, Buffalo	34.50	34.50	34.50	47.50	37.25
Rails, Rerolling, Chicago	65.50	65.50	64.50	63.50	51.00
No. 1 Cast, Chicago	46.50	46.50	45.50	41.50	35.00

COKE, Net Ton					
Beehive, Furn., Connlsvl.	$15.25	$15.25	$15.25	$15.25	$14.75
Beehive, Fdry., Connlsvl.	18.25	18.25	18.25	18.25	16.75
Oven, Fdry., Milwaukee	30.50	30.50	30.50	30.50	25.25

ANOTHER INDUCTO INSTALLATION...



Waukesha Improves Stainless Castings With INDUCTO Furnaces

Waukesha Foundry Company, Waukesha, Wisconsin, is a major producer of stainless steel castings with emphasis on parts for dairy and other food equipment. To minimize rejects, Waukesha has installed Inducto induction furnaces in its stainless foundry. If you are wondering how a furnace can cut rejects in castings, consider the following facts.

Inducto high-frequency induction furnaces with precision control provide a controllable analysis on alloys. Since the heat is generated in the metal itself, there is no excess or external heat to cause oxidation of some of the alloys. The electromagnetic stirring action of the induction furnace assures a uniform, homogenous alloy. Additionally, melt after melt can be exactly duplicated by the precise control of the Inducto equipment.

At Waukesha, two 650 lb. furnaces and an Inducto Push-Out furnace (not shown) are operated from a 175 KW m-g set and controlled from a single, compact control panel. The tilting furnaces are used for stainless castings while the Push-Out, a unique removable crucible furnace, is used for hard-to-melt non-ferrous alloys.

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Steel Prices

Mill prices as reported to STEEL, Sept 24, cents per pound except as otherwise noted. *Changes shown in italics.* Code number following mill points indicates producing company. Key to producers, page 126; footnotes, page 128.

SEMIFINISHED

INGOTS, Carbon, Forging (NT)
Munhall,Pa. U5 .....$76.00

INGOTS, Alloy (NT)
Detroit S41 .....$82.00
Economy,Pa. B14 .....82.00
Farrell,Pa. S3 .....82.00
Lowellville,O. S3 .....82.00
Midland,Pa. C18 .....82.00
Munhall,Pa. U5 .....82.00
Sharon,Pa. S3 .....82.00

BILLETS, BLOOMS & SLABS Carbon, Rerolling (NT)
Bartonville,Ill. K4 ....$82.00
Bessemer,Pa. U5 .....80.00
Buffalo R2 .....80.00
Clairton,Pa. U5 .....80.00
Ensley,Ala. T2 .....80.00
Fairfield,Ala. T2 .....80.00
Fontana,Calif. K1 ....90.50
Gary,Ind. U5 .....80.00
Johnstown,Pa. B3 ....80.00
Lackawanna,N.Y. B2 ..80.00
Munhall,Pa. U5 .....80.00
Owensboro,Ky. G8 ....77.50
S.Chicago,Ill. R2, U5 ..80.00
S.Duquesne,Pa. U5 ....80.00
Sterling,Ill. N15 .....80.00
Youngstown R2 .....80.00

Carbon, Forging (NT)
Bessemer,Pa. N5 ....$99.50
Buffalo R2 .....99.50
Canton,O. R2 .....102.00
Clairton,Pa. U5 .....99.50
Conshohocken,Pa. A3 ..104.50
Ensley,Ala. T2 .....99.50
Fairfield,Ala. T2 .....99.50
Farrell,Pa. S3 .....99.50
Fontana,Calif. K1 ....109.00
Gary,Ind. U5 .....99.50
Geneva,Utah C11 .....99.50
Houston S5 .....104.50
Johnstown,Pa. B2 ....99.50
Lackawanna,N.Y. B2 ..99.50
LosAngeles B3 .....109.00
Midland,Pa. C18 .....99.50
Munhall,Pa. U5 .....99.50
Owensboro,Ky. C8 ....96.00
Seattle B3 .....113.00
Sharon,Pa. S3 .....99.50
S.Chicago R2, U5, W14 ..99.50
S.Duquesne,Pa. U5 ....99.50
S.SanFrancisco B3 ..109.00
Warren,O. C17 .....99.50

Alloy, Forging (NT)
Bethlehem,Pa. R2 ....$119.00
Bridgeport,Conn. C32 ..119.00
Buffalo R2 .....119.00
Canton,O. R2, T7 ....119.00
Conshohocken,Pa. A3 ..126.00
Detroit S41 .....119.00
Economy,Pa. B14 .....119.00
Farrell,Pa. S3 .....119.00
Fontana,Calif. K1 ....140.00
Gary,Ind. U5 .....119.00
Houston S5 .....124.00
Ind.Harbor,Ind. Y1 ....119.00
Johnstown,Pa. B2 ....119.00
Lackawanna,N.Y. B2..119.00
LosAngeles B3 .....139.00
Lowellville,O. S3 ....119.00
Massillon,O. R2 .....119.00
Midland,Pa. C18 .....119.00
Munhall,Pa. U5 .....119.00
Owensboro,Ky. G8 ....114.00
Sharon,Pa. S3 .....119.00
S.Chicago R2,U5,W14 .119.00
S.Duquesne,Pa. U5 ..119.00
Struthers,O. Y1 .....119.00
Warren,O. C17 .....119.00

ROUNDS, SEAMLESS TUBE (NT)
Buffalo R2 .....$122.50
Canton,O. R2 .....125.00
Cleveland R2 .....122.50
Gary,Ind. U5 .....122.50
S.Chicago,Ill. R2, W14 122.50
S.Duquesne,Pa. U5 ..122.50
Warren,O. C17 .....122.50

SKELP
Aliquippa,Pa. J5 .....5.05
Munhall,Pa. U5 .....5.05
Pittsburgh J5 .....5.05
Warren,O. R2 .....5.05
Youngstown R2, U5 ....5.05

WIRE RODS
AlabamaCity,Ala. R2 ..6.40
Aliquippa,Pa. J5 .....6.40
Alton,Ill. L1 .....6.60
Bartonville,Ill. K4 .....6.50
Buffalo W12 .....6.40
Cleveland A7 .....6.40
Donora,Pa. A7 .....6.40
Fairfield,Ala. T2 .....6.40
Houston S5 .....6.65
IndianaHarbor,Ind. Y1..6.40
Johnstown,Pa. B2 .....6.40
Joliet,Ill. A7 .....6.40
KansasCity,Mo. S5 ....6.65
Kokomo,Ind. C16 .....6.50
LosAngeles B3 .....7.20
Minnequa,Colo. C10 ....6.65
Monessen,Pa. P7 .....6.40
N.Tonawanda,N.Y. B11..6.40
Pittsburg,Calif. C11 ....7.20
Portsmouth,O. P12 ....6.40
Roebling,N.J. R5 .....6.50
S.Chicago,Ill. R2, W14..6.40
SparrowsPoint,Md. B2 ..6.50
Sterling,Ill.(1) N15 ....6.40
Sterling,Ill. N15 .....6.50
Struthers,O. Y1 .....6.40
Worcester,Mass. A7 ....6.70

STRUCTURALS

Carbon Steel Std. Shapes
AlabamaCity,Ala. R2 ..5.50
Atlanta A11 .....5.70
Aliquippa,Pa. J5 .....5.50
Bessemer,Ala. T2 .....5.50
Bethlehem,Pa. B2 .....5.55
Birmingham C15 .....5.50
Clairton,Pa. U5 .....5.50
Fairfield,Ala. T2 .....5.50
Fontana,Calif. K1 ....6.30
Gary,Ind. U5 .....5.50
Geneva,Utah C11 .....5.50
Houston S5 .....5.60
Ind.Harbor,Ind. I-2, Y1..5.50
Johnstown,Pa. B2 .....5.55
Joliet,Ill. P22 .....5.50
KansasCity,Mo. S5 ....5.60
Lackawanna,N.Y. B2 ..5.55
LosAngeles B3 .....6.20
Minnequa,Colo. C10 ....5.80
Munhall,Pa. U5 .....5.50
Niles,Calif. P1 .....6.25
Phoenixville,Pa. P4 ....5.55
Portland,Oreg. O4 .....6.25
Seattle B3 .....6.25
S.Chicago,Ill. U5, W14..5.50
S.SanFrancisco B3 ....6.15
Sterling,Ill. N15 .....5.50
Torrance,Calif. C11 ....6.20
Weirton,W.Va. W6 ....5.50

Wide Flange
Bethlehem,Pa. B2 .....5.55
Clairton,Pa. U5 .....5.50
Fontana,Calif. K1 .....6.45
IndianaHarbor,Ind. I-2..5.50
Lackawanna,N.Y. B2 ..5.55
Munhall,Pa. U5 .....5.50
Phoenixville,Pa. P4 ....5.55
S.Chicago,Ill. U5 .....5.50
Weirton,W.Va. W6 ....5.50

Alloy Std. Shapes
Aliquippa,Pa. J5 .....6.80
Clairton,Pa. U5 .....6.80
Gary,Ind. U5 .....6.80
Houston S5 .....6.90
Munhall,Pa. U5 .....6.80
S.Chicago,Ill. U5, W14..6.80

H.S., L.A. Std. Shapes
Aliquippa,Pa. J5 .....8.05
Bessemer,Ala. T2 .....8.05
Bethlehem,Pa. B2 .....8.10
Clairton,Pa. U5 .....8.05
Fairfield,Ala. T2 .....8.05
Fontana,Calif. K1 ....8.85
Gary,Ind. U5 .....8.05
Geneva,Utah C11 .....8.05
Houston S5 .....8.15
Ind.Harbor,Ind. I-2, Y1..8.05
Johnstown,Pa. B2 ....8.10
KansasCity,Mo. S5 ....8.15
Lackawanna,N.Y. B2 ..8.10
LosAngeles B3 .....8.75
Munhall,Pa. U5 .....8.05
Seattle B3 .....8.80
S.Chicago,Ill. U5, W14..8.05
S.SanFrancisco B3 ....8.70
Struthers,O. Y1 .....8.05

H.S., L.A. Wide Flange
Bethlehem,Pa. B2 .....8.10
Ind.Harbor,Ind. I-2 ....8.05
Lackawanna,N.Y. B2 ..8.10
Munhall,Pa. U5 .....8.05
S.Chicago,Ill. U5 .....8.05

PILING

BEARING PILES
Bethlehem,Pa. B2 .....5.55
Ind.Harbor,Ind. I-2 ....5.50
Lackawanna,N.Y. B2 ..5.55
Munhall,Pa. U5 .....5.50
S.Chicago,Ill. I-2, U5 ..5.50

STEEL SHEET PILING
Ind.Harbor,Ind. I-2 ....6.50
Lackawanna,N.Y. B2 ..6.50
Munhall,Pa. U5 .....6.50
S.Chicago,Ill. I-2, U5 ..6.50
Weirton,W.Va. W6 ....6.50

PLATES

PLATES, Carbon Steel
AlabamaCity,Ala. R2 ..5.30
Aliquippa,Pa. J5 .....5.30
Ashland,Ky.(15) A10 ...5.30
Atlanta A11 .....5.50
Bessemer,Ala. T2 .....5.30
Clairton,Pa. U5 .....5.30
Claymont,Del. C22 ....5.30
Cleveland J5, R2 .....5.30
Coatesville,Pa. L7 .....5.30
Conshohocken,Pa. A3 ..5.30
Ecorse,Mich. G5 .....5.30
Fairfield,Ala. T2 .....5.30
Farrell,Pa. S3 .....5.30
Fontana,Calif.(30) K1 ..6.10
Gary,Ind. U5 .....5.30
Geneva,Utah C11 .....5.30
GraniteCity,Ill. G4 ....5.40
Harrisburg,Pa. P4 .....5.30
Houston S5 .....5.40
Ind.Harbor,Ind. I-2, Y1..5.30
Johnstown,Pa. B2 .....5.30
Lackawanna,N.Y. B2 ..5.30
Mansfield,O. E6 .....5.30
Minnequa,Colo. C10 ....6.15
Munhall,Pa. U5 .....5.30
Newport,Ky. A2 .....5.30
Pittsburgh J5 .....5.30
Riverdale,Ill. A1 .....5.30
Seattle B3 .....6.20
Sharon,Pa. S3 .....5.30
S.Chicago,Ill. U5, W14 ..5.30
SparrowsPoint,Md. B2 ..5.30
Sterling,Ill. N15 .....5.30
Steubenville,O. W10 ....5.30
Warren,O. R2 .....5.30
Youngstown U5, Y1 ....5.30
Youngstown(27) R2 ....5.30

PLATES, Carbon Abras. Resist.
Claymont,Del. C22 ....6.75
Fontana,Calif. K1 .....7.85
Geneva,Utah C11 .....7.05
Houston S5 .....7.15
Johnstown,Pa. B2 .....7.05
SparrowsPoint,Md. B2 ..7.05

PLATES, Wrought Iron
Economy,Pa. B14 .....13.15

PLATES, H.S., L.A.
Aliquippa,Pa. J5 .....7.95
Ashland,Ky. A10 .....7.95
Bessemer,Ala. T2 .....7.95
Clairton,Pa. U5 .....7.95
Claymont,Del. C22 ....7.95
Cleveland J5, R2 .....7.95
Coatesville,Pa. L7 ....7.625
Conshohocken,Pa. A3 ..7.95
Economy,Pa. B14 .....7.95
Ecorse,Mich. G5 .....7.95
Fairfield,Ala. T2 .....7.95
Farrell,Pa. S3 .....7.95
Fontana,Calif.(30) K1 ..8.75
Gary,Ind. U5 .....7.95
Geneva,Utah C11 .....7.95
Houston S5 .....8.05
Ind.Harbor,Ind. I-2, Y1..7.95
Johnstown,Pa. B2 .....7.95
Munhall,Pa. U5 .....7.95
Pittsburgh J5 .....7.95
Seattle B3 .....8.85
Sharon,Pa. S3 .....7.95
S.Chicago,Ill. U5, W14..7.95
SparrowsPoint,Md. B2 ..7.95
Warren,O. R2 .....7.95
Youngstown U5, Y1 ....7.95

PLATES, ALLOY
Aliquippa,Pa. J5 .....7.50
Claymont,Del. C22 .....7.50
Coatesville,Pa. L17 ....7.50
Economy,Pa. B14 .....7.50
Farrell,Pa. S3 .....7.50
Fontana,Calif. K1 .....8.30
Gary,Ind. U5 .....7.50
Houston S5 .....7.60
Ind.Harbor,Ind. Y1 ....7.50
Johnstown,Pa. B2 .....7.50
Lowellville,O. S3 .....7.50
Munhall,Pa. U5 .....7.50
Newport,Ky. A2 .....7.50
Pittsburgh J5 .....7.50
Seattle B3 .....8.40
Sharon,Pa. S3 .....7.50
S.Chicago,Ill. U5, W14..7.50
SparrowsPoint,Md. B2 ..7.50
Youngstown Y1 .....7.50

FLOOR PLATES
Cleveland J5 .....6.375
Conshohocken,Pa. A3 ..6.375
Ind.Harbor,Ind. I-2 ..6.375
Munhall,Pa. U5 .....6.375
S.Chicago,Ill. U5 .....6.375

PLATES, Ingot Iron
Ashland c.l.(15) A10 ..5.55
Ashland l.c.l.(15) A10 ..6.05
Cleveland c.l. R2 .....6.05
Warren,O. c.l. R2 .....6.05

BARS

BARS, Hot-Rolled Carbon (Merchant Quality)
Ala.City,Ala.(9) R2 ..5.675
Aliquippa,Pa.(9) J5 ..5.675
Alton,Ill. L1 .....5.875
Atlanta(9) A11 .....5.875
Bessemer,Ala.(9) T2 ..5.675
Birmingham(9) C15 ..5.675
Buffalo(9) R2 .....5.675
Canton,O.(23) R2 .....6.15
Clairton,Pa.(9) U5 ....5.675
Cleveland(9) R2 .....5.675
Ecorse,Mich.(9) G5 ..5.675
Emeryville,Calif. J7 ...6.425
Fairfield,Ala.(9) T2 ..5.675
Fairless,Pa.(9) U5 ....5.825
Fontana,Calif.(9) K1..6.375
Gary,Ind.(9) U5 .....5.675
Houston(9) S5 .....5.925
Ind.Harbor(9) I-2, Y1..5.675
Johnstown,Pa.(9) B2 ..5.675
Joliet,Ill. P22 .....5.675
KansasCity,Mo.(9) S5..5.925
Lackawanna(9) B2 ....5.675
LosAngeles(9) B3 ....6.375
Massillon,O.(23) R2 ....6.15
Midland,Pa.(23) C18 ..6.025
Milton,Pa. M18 .....5.825
Minnequa,Colo. C10 ...6.125
Niles,Calif. P1 .....6.375
N.T'wanda,N.Y.(23)B11 6.025
Owensboro,Ky.(9) G8 ..5.425
Pittsburg,Calif.(9) C11..6.375
Pittsburgh(9) J5 .....5.675
Portland,Oreg. O4 .....6.425
Riverdale,Ill.(9) A1 ..5.675
Seattle B3, N14 .....6.425
S.Ch'c'go(9)R2,U5,W14 5.675
S.Duquesne,Pa.(9) U5..5.675
S.SanFran.,Calif.(9)B3 6.425
Sterling,Ill.(1)(9) N15..5.675
Sterling,Ill.(9) N15 ....5.775
Struthers,O.(9) Y1 ....5.675
Tonawanda,N.Y. B12 ..5.675
Torrance,Calif.(9) C11..6.375
Warren,O. C17 .....6.025
Youngstown(9) R2, U5..5.675

BARS, Hot-Rolled Alloy
Aliquippa,Pa. J5 .....6.725
Bethlehem,Pa. B2 .....6.725
Bridgeport,Conn. C32 ..6.80
Buffalo R2 .....6.725
Canton,O. R2, T7 .....6.725
Clairton,Pa. U5 .....6.725
Detroit S41 .....6.725
Economy,Pa. B14 .....6.725
Ecorse,Mich. G5 .....6.725
Fairless,Pa. U5 .....6.875
Farrell,Pa. S3 .....6.725
Fontana,Calif. K1 ....7.775
Gary,Ind. U5 .....6.725
Houston S5 .....6.975
Ind.Harbor,Ind. I-2, Y1..6.725
Johnstown,Pa. B2 .....6.725
KansasCity,Mo. S5 ....6.975
Lackawanna,N.Y. B2 ..6.725
Lowellville,O S3 .....6.725
LosAngeles B3 .....7.775
Massillon,O. R2 .....6.725
Midland,Pa. C18 .....6.725
Owensboro,Ky. G8 ....6.475
Pittsburgh J5 .....6.725
Sharon,Pa. S3 .....6.725
S.Chicago R2, U5, W14..6.725
S.Duquesne,Pa. U5 ....6.725
Struthers,O. Y1 .....6.725
Warren,O. C17 .....6.725
Youngstown U5 .....6.725

BARS & SMALL SHAPES, H.R. High-Strength, Low-Alloy
Aliquippa,Pa. J5 .....8.30
Bessemer,Ala. T2 .....8.30
Bethlehem,Pa. B2 .....8.30
Clairton,Pa. U5 .....8.30
Cleveland R2 .....8.30
Ecorse,Mich. G5 .....8.30
Fairfield,Ala. T2 .....8.30
Fontana,Calif. K1 .....9.00
Gary,Ind. U5 .....8.30
Houston S5 .....8.55
Ind.Harbor,Ind. Y1 ....8.30
Johnstown,Pa. B2 .....8.30
KansasCity,Mo. S5 ....8.55
Lackawanna,N.Y. B2 ..8.30
Los Angeles B3 .....9.00
Pittsburgh J5 .....8.30
Seattle B3 .....9.05
S.Chicago,Ill. R2, W14..8.30
S.Duquesne,Pa. U5 ....8.30
S.SanFrancisco B3 ....9.05
Struthers,O. Y1 .....8.30
Youngstown U5 .....8.30

BAR SIZE ANGLES; H.R. Carbon
Bethlehem,Pa.(9) B2 ..5.825
Houston(9) S5 .....5.925
KansasCity,Mo.(9) S5..5.925
Lackawanna(9) B2 ....5.675
Sterling,Ill. N15 .....5.775
Sterling,Ill.(1) N15 ..5.675
Tonawanda,N.Y. B12 ..5.675

BAR SIZE ANGLES; S. Shapes
Aliquippa,Pa. J5 .....5.675
Atlanta A11 .....5.875
Joliet,Ill. P22 .....5.675
Minnequa,Colo. C10 ..6.125
Niles,Calif. P1 .....6.375
Pittsburgh J5 .....5.675
Portland,Oreg. O4 ....6.425
SanFrancisco S7 .....6.52
Seattle B3 .....6.425

BAR SHAPES, Hot-Rolled Alloy
Aliquippa,Pa. J5 .....6.80
Clairton,Pa. U5 .....6.80
Gary,Ind. U5 .....6.80
Houston S5 .....7.05
KansasCity,Mo. S5 ....7.05
Pittsburgh J5 .....6.80
Youngstown U5 .....6.80

BARS, C. F. Leaded (Including leaded extra)
Carbon
LosAngeles P2, S30 ..11.75*

Alloy
Ambridge,Pa. W18 ..10.175
BeaverFalls,Pa. M12..10.175
Camden,N.J. P13 ....10.35
Chicago W18 .....10.175
Elyria,O. W8 .....10.175
Monaca,Pa. S17 .....10.175
Newark,N.J. W18 ....10.35
SpringCity,Pa. K3 ....10.35

*Grade A; add 0.050c for Grade B.

BARS, Cold-Finished Carbon
Ambridge,Pa. W18 ....7.65
BeaverFalls,Pa. M12,R2.7.65
Birmingham C15 .....8.25
Buffalo B5 .....7.70
Camden,N.J. P13 .....8.10
Carnegie,Pa. C12 .....7.65
Chicago W18 .....7.65
Cleveland A7, C20 ....7.65
Detroit B5, P17 .....7.85
Detroit S41 .....7.65
Donora,Pa. A7 .....7.65
Elyria,O. W8 .....7.65
FranklinPark,Ill. N5 ...7.65
Gary,Ind. R2 .....7.65
GreenBay,Wis. F7 .....7.65
Hammond,Ind. J5, L2 ...7.65
Hartford,Conn. R2 ....8.15
Harvey,Ill. B5 .....7.65
LosAngeles(49) S30 ....9.10
LosAngeles(49) P2, R2.9.10
Mansfield,Mass. B2 ....8.20
Massillon,O. R2, R8 ....7.65
Midland,Pa. C18 .....7.65
Monaca,Pa. S17 .....7.65
Newark,N.J. W18 .....8.10
NewCastle,Pa.(17) B4 ..7.65
Pittsburgh J5 .....7.65
Plymouth,Mich. P5 ....7.90
Putnam,Conn. W18 ....8.20
Readville,Mass. C14 ....8.20
S.Chicago,Ill. W14 ....7.65
SpringCity,Pa. K3 ....8.10
Struthers,O. Y1 .....7.65
Warren,O. C17 .....7.65
Willimantic,Conn. J5 ...8.15
Waukegan,Ill. A7 .....7.65
Youngstown F3, Y1 ...7.65

BARS, Cold-Finished Carbon (Turned and Ground)
Cumberland,Md.(5) C19.6.55

BARS, Cold-Finished Alloy
Ambridge,Pa. W18 ...9.025
BeaverFalls,Pa. M12,R2 9.025
Bethlehem,Pa. B2 ....9.025
Bridgeport,Conn. C32 ..9.175
Buffalo B5 .....9.025
Camden,N.J. P13 .....9.20
Canton,O. T7 .....8.775
Carnegie,Pa. C12 .....9.025
Chicago W18 .....9.025
Cleveland A7, C20 ....9.025
Detroit B5, P17 .....9.225
Detroit S41 .....9.025
Donora,Pa. A7 .....9.025
Elyria,O. W8 .....9.025
FranklinPark,Ill. N5 ...9.025
Gary,Ind. R2 .....9.025
GreenBay,Wis. F7 .....9.025
Hammond,Ind. J5, L2..9.025
Hartford,Conn. R2 ....9.325
Harvey,Ill. B5 .....9.025
Lackawanna,N.Y. B2 ..9.025
LosAngeles P2, S30 ...11.00
Mansfield,Mass. B5 ...9.325
Massillon,O. R2, R8 ...9.025
Midland,Pa. C18 .....9.025
Monaca,Pa. S17 .....9.025
Newark,N.J. W18 .....9.20
Plymouth,Mich. P5 ....9.225
S.Chicago,Ill. W14 ....9.025
SpringCity,Pa. K3 ....9.20
Struthers,O. Y1 .....9.025
Warren,O. C17 .....9.025
Waukegan,Ill. A7 .....9.025
Willimantic,Conn. J5 ...9.325
Worcester,Mass. A7 ...9.325
Youngstown F3, Y1 ...9.025

BARS, Reinforcing (To Fabricators)

AlabamaCity,Ala. R2 ..5.675
Atlanta A11 .....5.675
Birmingham C15 .....5.675
Buffalo R2 .....5.675
Cleveland R2 .....5.675
Ecorse, Mich. G5 .....5.675
Emeryville,Calif. J7 ...6.425
Fairfield,Ala. T2 .....5.675
Fairless,Pa. U5 .....5.825
Fontana,Calif. K1 .....6.375
Ft.Worth,Tex.(4)(28)T4 6.125
Gary,Ind. U5 .....5.675
Houston S5 .....5.925
Ind.Harbor,Ind. I-2, Y1 5.675
Johnstown,Pa. B2 .....5.675
Joliet,Ill. P22 .....5.675
KansasCity,Mo. S5 ....5.925
Kokomo,Ind. C16 .....5.775
Lackawanna,N.Y. B2 ..5.675
LosAngeles B3 .....6.375
Madison,Ill. L1 .....5.625
Milton,Pa. M18 .....5.825
Minnequa,Colo. C10 ...6.125
Niles,Calif. P1 .....6.375
Pittsburg,Calif. C11 ..6.375
Pittsburgh J5 .....5.675
Portland,Oreg. O4 .....6.425
SandSprings,Okla. S5 ..5.925
Seattle B3, N14 .....6.425
S.Chicago,Ill. R2, W14.5.675
S.Duquesne,Pa. U5 ....5.675
S.SanFrancisco B3 .....6.425
SparrowsPoint,Md. B2 .5.675
Sterling,Ill.(1) N15 ....5.675
Sterling,Ill. N15 .....5.775
Struthers,O. Y1 .....5.675
Tonawanda,N.Y. B12 ..6.10
Torrance,Calif. C11 ...6.375
Youngstown R2, U5 ..5.675

BARS, Reinforcing (Fabricated; to Consumers)

Baltimore B2 .....7.42
Boston B2, U8 .....8.15
Chicago U8 .....7.41
Cleveland U8 .....7.39
Houston S5 .....7.60
Johnstown,Pa. B2 .....7.33
KansasCity,Mo. S5 ....7.60
Lackawanna,N.Y. B2 ..7.35
Marion,O. P11 .....6.70
Newark, N.J. U8 .....7.80
Philadelphia U8 .....7.63
Pittsburgh J5, U8 .....7.35
SandSprings,Okla. S5 ...7.60
Seattle B3, N14 .....7.95
SparrowsPt.,Md. B2 ...7.33
St.Paul U8 .....8.17
Williamsport,Pa. S19 ...7.25

BARS, Wrought Iron

Economy,Pa.(S.R.)B14 14.45
Economy,Pa.(D.R.)B14 18.00
Economy(Staybolt)B14 18.45

RAIL STEEL BARS

ChicagoHts.(3) C2, I-2 5.575
ChicagoHts.(4)(44) I-2 5.675
ChicagoHts.(4) C2 .....5.675
Franklin,Pa.(3) F5 .....5.575
Franklin,Pa.(4) F5 .....5.675
JerseyShore,Pa.(3) J8 ..5.55
Marion,O.(3) P11 .....5.575
Tonawanda(3) B12 .....5.575
Tonawanda(4) B12 .....6.10

SHEETS

SHEETS, Hot-Rolled Steel (18 Gage and Heavier)

AlabamaCity,Ala. R2 ...5.10
Allenport,Pa. P7 .....5.10
Aliquippa,Pa. J5 .....5.10
Ashland,Ky.(8) A10 ...5.10
Cleveland J5, R2 .....5.10
Conshohocken,Pa. A3 ..5.15
Detroit(8) M1 .....5.10
Ecorse,Mich. G5 .....5.10
Fairfield,Ala. T2 .....5.10
Fairless,Pa. U5 .....5.15
Farrell,Pa. S3 .....5.10
Fontana,Calif. K1 ....5.825
Gary,Ind. U5 .....5.10
Geneva,Utah C11 .....5.20
GraniteCity,Ill.(8) G4 ..5.20
Ind.Harbor,Ind. I-2, Y1.5.10
Irvin,Pa. U5 .....5.10
Lackawanna,N.Y. B2 ..5.10
Mansfield,O. E6 .....5.10
Munhall,Pa. U5 .....5.10
Newport,Ky. A2 .....5.10
Niles,O. M21, S3 .....5.10
Pittsburg,Calif. C11 ...5.80
Pittsburgh J5 .....5.10
Portsmouth,O. P12 .....5.10
Riverdale,Ill. A1 .....5.10
Sharon,Pa. S3 .....5.10
S.Chicago,Ill. U5, W14.5.10
SparrowsPoint,Md. B2 ..5.10
Steubenville,O. W10 ...5.10
Warren,O. R2 .....5.10
Weirton,W.Va. W6 ....5.10
Youngstown U5, Y1 ...5-10

SHEETS, H.R. (19 Ga. & Lighter)

Niles,O. M21 .....6.275

SHEETS, H.R. Alloy

Gary,Ind. U5 .....8.40
Ind.Harbor,Ind. Y1 .....8.10
Irvin,Pa. U5 .....8.40
Munhall,Pa. U5 .....8.40
Newport,Ky. A2 .....8.40
Youngstown U5 .....8.40
Youngstown Y1 .....8.10

SHEETS, H.R. (14 Ga. & Heavier) High-Strength, Low-Alloy

Aliquippa Pa. J5 ... 7.595
Ashland,Ky. A10 .....7.525
Cleveland J5, R2 .....7.525
Conshohocken,Pa. A3 ..7.575
Ecorse,Mich. G5 .....7.525
Fairfield,Ala. T2 .....7.525
Fairless,Pa. U5 .....7.575
Farrell,Pa. S3 .....7.525
Fontana,Calif. K1 .....8.25
Gary,Ind. U5 .....7.525
Ind.Harbor,Ind. I-2, Y1 7.525
Irvin,Pa. U5 .....7.525
Lackawanna(35) B2 ..7.525
Munhall,Pa. U5 .....7.525
Pittsburgh J5 .....7.525
S.Chicago,Ill. U5, W14.7.525
Sharon,Pa. S3 .....7.525
SparrowsPoint(36) B2 ..7.525
Warren,O. R2 .....7.525
Weirton,W.Va. W6 ....7.525
Youngstown U5, Y1 ..7.525

SHEETS, Hot-Rolled Ingot Iron (18 Gage and Heavier)

Ashland,Ky.(8) A10 ...5.35
Cleveland R2 .....5.875
Warren,O. R2 .....5.875

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2 .....7.05
Middletown,O. A10 ...6.775
Warren,O. R2 .....7.05

SHEETS, Cold-Rolled Steel (Commercial Quality)

AlabamaCity,Ala. R2 ..6.275
Allenport,Pa. P7 .....6.275
Aliquippa,Pa. J5 .....6.275
Cleveland J5, R2 .....6.275
Conshohocken,Pa. A3 ..6.325
Detroit M1 .....6.275
Ecorse,Mich. G5 .....6.275
Fairfield,Ala. T2 .....6.275
Fairless,Pa. U5 .....6.325
Follansbee,W.Va. F4 ..6.275
Fontana,Calif. K1 .....7.40
Gary,Ind. U5 .....6.275
GraniteCity,Ill. G4 ...6.375
Ind.Harbor,Ind. I-2, Y1.6.275
Irvin,Pa. U5 .....6.275
Lackawanna,N.Y. B2 ..6.275
Mansfield,O. E6 .....6.275
Middletown,O. A10 ....6.275
Newport,Ky. A2 .....6.275
Pittsburg,Calif. C11 ..7.225
Pittsburgh J5 .....6.275
Portsmouth,O. P12 ....6.275
SparrowsPoint,Md. B2..6.275
Steubenville,O. W10 ..6.275
Warren,O. R2 .....6.275
Weirton,W.Va. W6 ....6.275
Yorkville,O. W10 .....6.275
Youngstown Y1 .....6.275

SHEETS, Cold-Rolled, High-Strength, Low-Alloy

Aliquippa,Pa. J5 .....9.275
Cleveland J5 R2 .....9.275
Ecorse,Mich. G5 .....9.275
Fairless,Pa. U5 .....9.325
Fontana,Calif. K1 .....10.40
Gary,Ind. U5 .....9.275
Ind.Harbor,Ind. I-2,Y1.9.275
Irvin,Pa. U5 .....9.275
Lackawanna(37) B2 ..9.275
Pittsburgh J5 .....9.275
SparrowsPoint(38) B2..9.275
Warren,O. R2 .....9.275
Weirton,W.Va. W6 ....9.275
Youngstown Y1 .....9.275

SHEETS, Culvert

	Cu Steel	Cu Fe
Ala.City,Ala. R2	7.225	....
Ashland,Ky. A10	7.225	7.475
Canton,O. R2	7.225	7.75
Fairfield T2	7.225	7.475
Gary,Ind. U5	7.225	7.475
GraniteCity,Ill.G4	7.325	....
Ind.Harbor I-2	7.225	7.475
Irvin,Pa. U5	7.225	7.475
Kokomo,Ind. C16	7.325	....
MartinsFry. W10	7.225	7.475
Pitts.,Calif. C11	7.975	....
Pittsburgh J5	7.225	....
SparrowsPt. B2	7.225	....

SHEETS, Culvert—Pure Iron

Ind.Harbor,Ind. I-2 ...7.475

SHEETS, Galvanized Steel Hot-Dipped

AlabamaCity,Ala. R2.6.875‡
Ashland,Ky. A10 .....6.875†
Canton,O. R2 .....6.875‡
Dover,O. E6 .....6.875†
Fairfield,Ala. T2 .....6.875†
Gary,Ind. U5 .....6.875†
GraniteCity,Ill. G4 ..6.975•
Ind.Harbor,Ind. I-2 ..6.875†
Irvin,Pa. U5 .....6.875†
Kokomo,Ind. C16 .....6.975‡
MartinsFerry,O. W10 ..6.875•
Middletown,O. A10 ..6.875†
Pittsburg,Calif. C11 ..7.625•
Pittsburgh J5 .....6.875†
SparrowsPt.,Md. B2 ..6.875†
Warren,O. R2 .....6.875†
Weirton,W.Va. W6 ...6.875•

•Continuous and noncontinuous. †Continuous. ‡Noncontinuous.

SHEETS, Well Casing

Fontana,Calif. K1 .....7.325

SHEETS, Galvanized High-Strength, Low-Alloy

Irvin,Pa. U5 .....10.625
SparrowsPt.(39) B2 ..10.625
Pittsburgh J5 .....10.125

SHEETS, Galvannealed Steel

Canton,O. R2 .....7.275
Irvin,Pa. U5 .....7.275

SHEETS, Galvanized Ingot Iron (Hot-Dipped Continuous)

Ashland,Ky. A10 .....7.125
Middletown,O. A10 ....7.125

SHEETS, Electrogalvanized

Cleveland(28) R2 .....7.65
Niles,O.(28) R2 .....7.65
Youngstown J5 .....7.80
Weirton,W.Va. W6 .....7.50

SHEETS, Aluminum Coated

Butler,Pa. A10 (type 1) 9.525
Butler,Pa. A10 (type 2) 9.625

SHEETS, Enameling Iron

Ashland,Ky.. A10 .....6.775
Cleveland R2 .....6.775
Fairfield,Ala. T2 .....6.775
Gary,Ind. U5 .....6.775
GraniteCity,Ill. G4 ...6.875
Ind.Harbor,Ind. I-2,Y1.6.775
Irvin,Pa. U5 .....6.775
Middletown,O. A10 ....6.775
Niles,O. M21, S3 .....6.775
Youngstown Y1 .....6.775

BLUED STOCK, 29 Gage

Follansbee,W.Va. F4 ..8.70
Ind.Harbor,Ind. I-2 ...8.70
Mansfield,O. E6 .....8.70
Warren R2 .....8.70
Yorkville,O. W10 .....8.70

SHEETS, Long Terne, Steel (Commercial Quality)

BeechBottom,W.Va.W10 7.225
Gary,Ind. U5 .....7.225
Mansfield,O. E6 .....7.225
Middletown,O. A10 ....7.225
Niles,O. M21, S3 .....7.225
Warren,O. R2 .....7.225
Weirton,W.Va. W6 ....7.225

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10 ....7.625

Key To Producers

A1 Acme Steel Co.
A2 Acme-Newport Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A5 Alloy Metal Wire Div., H. K. Porter Co. Inc.
A6 American Shim Steel Co.
A7 American Steel & Wire Div., U. S. Steel Corp.
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.
B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B8 Braeburn Alloy Steel
B9 Brainard Steel Div., Sharon Steel Corp.
B10 E. & G. Brooke, Wickwire Spencer Steel Div., Colo. Fuel & Iron
B11 Buffalo Bolt Co., Div., Buffalo Eclipse Corp.
B12 Buffalo Steel Corp.
B14 A. M. Byers Co.
B15 J. Bishop & Co.
C1 Calstrip Steel Corp.
C2 Calumet Steel Div., Borg-Warner Corp.
C4 Carpenter Steel Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C15 Connors Steel Div., H. K. Porter Co. Inc.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Plant, Wickwire Spencer Steel Div., Colo. Fuel & Iron
C23 Charter Wire Inc.
C24 G. O. Carlson Inc.
C32 Carpenter Steel of N.Eng.
D2 Detroit Steel Corp.
D3 Dearborn Div., Sharon Steel Corp.
D4 Disston Div., H. K. Porter Co. Inc.
D6 Driver-Harris Co.
D7 Dickson Weatherproof Nail Co.
D8 Damascus Tube Co.
D9 Wilbur B. Driver Co.
E1 Eastern Gas & Fuel Assoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire-Reeves Steel Corp.
F2 Firth Sterling Inc.
F3 Fitzsimmons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div., Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
F8 Ft. Wayne Metals Inc.
G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.
G8 Green River Steel Corp.
H1 Hanna Furnace Corp.
H7 Helical Tube Co.
I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
I-6 Ivins Steel Tube Works
I-7 Indiana Steel & Wire Co.
J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.
K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K7 Kenmore Metals Corp.
L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L6 Lone Star Steel Co.
L7 Lukens Steel Co.
L8 Leschen Wire Rope Div., H. K. Porter Co. Inc.
M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M6 Mercer Pipe Div., Sawhill Tubular Products
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M14 McInnes Steel Co.
M16 Md. Fine & Special. Wire
M17 Metal Forming Corp.
M18 Milton Steel Div., Merritt-Chapman&Scott
M21 Mallory-Sharon Metals Corp.
M22 Mill Strip Products Co.
N1 National-Standard Co.
N2 National Supply Co.
N3 National Tube Div., U. S. Steel Corp.
N5 Nelsen Steel & Wire Co.
N6 New England High Carbon Wire Co.
N8 Newman-Crosby Steel
N14 Northwest. Steel Rolling Mills Inc.
N15 Northwestern S.&W. Co.
N20 Neville Ferro Alloy Co.
O4 Oregon Steel Mills
P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co., Sub. of Barium Steel Corp.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke & Chem.
P7 Pittsburgh Steel Co.
P11 Pollak Steel Co.
P12 Portsmouth Div., Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., American Chain & Cable
P17 Plymouth Steel Corp.
P19 Pitts. Rolling Mills
P20 Prod. Steel Strip Corp.
P22 Phoenix Mfg. Co.
P24 Phil. Steel & Wire Corp.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R8 Reliance Div., Eaton Mfg.
R9 Rome Mfg. Co.
R10 Rodney Metals Inc.
S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Div., Armco Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S12 Spencer Wire Corp.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S17 Superior Drawn Steel Co.
S18 Superior Steel Div., Copperweld Steel Co.
S19 Sweet's Steel Co.
S20 Southern States Steel
S23 Superior Tube Co.
S25 Stainless Welded Prod.
S26 Specialty Wire Co. Inc.
S30 Sierra Drawn Steel Corp.
S40 Seneca Steel Service
S41 Stainless & Strip Div., J&L Steel Corp.
S42 Southern Elec. Steel Co.
T2 Tenn. Coal & Iron Div., U. S. Steel Corp.
T3 Tenn. Products & Chemical Corp.
T4 Texas Steel Co.
T5 Thomas Strip Div., Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div., Am. Rad. & Stan. San.
T13 Tube Methods Inc.
T19 Techalloy Co. Inc.
U3 Union Wire Rope Corp.
U4 Universal-Cyclops Steel
U5 United States Steel Corp.
U6 U. S. Pipe & Foundry
U7 Ulbrich Stainless Steels
U8 U. S. Steel Supply Div., U. S. Steel Corp.
V2 Vanadium-Alloys Steel
V3 Vulcan-Kidd Steel Div., H. K. Porter Co.
W1 Wallace Barnes Steel Div., Associated Spring Corp.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W8 Western Automatic Machine Screw Co.
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div., International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.
Y1 Youngstown Sheet & Tube

STRIP

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2	5.10
Allenport,Pa. P7	5.10
Alton,Ill. L1	5.30
Ashland,Ky.(8) A10	5.10
Atlanta A11	5.10
Bessemer,Ala. T2	5.10
Birmingham C15	5.10
Buffalo(27) R2	5.10
Conshohocken,Pa. A3	5.15
Detroit M1	5.10
Ecorse,Mich. G5	5.10
Fairfield,Ala. T2	5.10
Farrell,Pa. S3	5.10
Fontana,Calif. K1	5.825
Gary,Ind. U5	5.10
Ind.Harbor,Ind. I-2, Y1	5.10
Johnstown,Pa.(25) B2	5.10
Lackaw'na,N.Y.(25) B2	5.10
LosAngeles(25) B3	5.85
LosAngeles C1	8.60
Minnequa,Colo. C10	6.20
Riverdale,Ill. A1	5.10
SanFrancisco S7	6.60
Seattle(25) B3	6.10
Seattle N14	6.60
Sharon,Pa. S3	5.10
S.Chicago W14	5.10
S.SanFrancisco(25) B3	5.85
SparrowsPoint,Md. B2	5.10
Torrance,Calif. C11	5.85
Warren,O. R2	5.10
Weirton,W.Va. W6	5.10
Youngstown U5	5.10

STRIP, Hot-Rolled Alloy

Carnegie,Pa. S18	8.10
Farrell,Pa. S3	8.40
Gary,Ind. U5	8.40
Houston S5	8.65
Ind.Harbor,Ind. Y1	8.10
KansasCity,Mo. S5	8.65
LosAngeles B3	9.30
Lowellville,O. S3	8.40
Newport,Ky. A2	8.40
Sharon,Pa. A2, S3	8.40
S.Chicago,Ill. W14	8.40
Youngstown U5	8.40
Youngstown Y1	8.10

STRIP, Hot-Rolled High-Strength, Low-Alloy

Ashland,Ky. A10	7.575
Bessemer,Ala. T2	7.575
Conshohocken,Pa. A3	7.575
Ecorse,Mich. G5	7.575
Fairfield,Ala. T2	7.575
Farrell,Pa. S3	7.575
Gary,Ind. U5	7.575
Ind.Harbor,Ind. I-2,Y1	7.575
Lackawanna,N.Y. B2	7.575
LosAngeles(25) B3	8.325
Seattle(25) B3	8.575
Sharon,Pa. S3	7.575
S.Chicago,Ill. W14	7.575
S.SanFrancisco(25) B3	8.325
SparrowsPoint,Md. B2	7.575
Warren,O. R2	7.575
Weirton,W.Va. W6	7.575
Youngstown U5, Y1	7.575

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10	5.35
Warren,O. R2	5.875

STRIP, Cold-Rolled Carbon

Anderson,Ind. G6	7.425
Baltimore T6	7.425
Boston T6	7.975
Buffalo S40	7.425
Cleveland A7, J5	7.425
Dearborn,Mich. D3	7.425
Detroit D2, M1, P20	7.425
Dover,O. G6	7.425
Ecorse,Mich. G5	7.15
Evanston,Ill. M22	7.525
Farrell,Pa. S3	7.425
Follansbee,W.Va. F4	7.425
Fontana,Calif. K1	9.20
FranklinPark,Ill. T6	7.525
Ind.Harbor,Ind. Y1	7.425
Indianapolis S41	7.575
LosAngeles J5	9.325
LosAngeles C1	9.30
NewBedford,Mass. R10	7.875
NewBritain,Conn. S15	7.875
NewCastle,Pa. B4, E5	7.425
NewHaven,Conn. D2	7.875
NewKensington,Pa. A6	7.425
Pawtucket,R.I. R3	7.975
Pawtucket,R.I. N8	7.975
Philadelphia P24	7.875
Pittsburgh J5	7.425
Riverdale,Ill. A1	7.525
Rome,N.Y.(32) R6	7.425
Sharon,Pa. S3	7.425
Trenton,N.J.(31) R5	8.875
Wallingford,Conn. W2	7.875
Warren,O. R2, T5	7.425
Worcester,Mass. A7	7.975
Youngstown S41, Y1	7.425

STRIP, Cold-Rolled Alloy

Boston T6	15.90
Carnegie,Pa. S18	15.05
Cleveland A7	15.05
Dover,O. G6	15.55
Farrell,Pa. S3	15.55
FranklinPark,Ill. T6	15.55
Harrison,N.J. C18	15.05
Indianapolis S41	15.70
Lowellville,O. S3	15.55
Pawtucket,R.I. N8	15.90
Riverdale,Ill. A1	15.55
Sharon,Pa. S3	15.55
Worcester,Mass. A7	15.35
Youngstown S41	15.55

STRIP, Cold-Rolled High-Strength, Low-Alloy

Cleveland A7	10.45
Dearborn,Mich. D3	10.80
Dover,O. G6	10.80
Ecorse,Mich. G5	10.50
Farrell,Pa. S3	10.80
Ind.Harbor,Ind. Y1	10.80
Sharon,Pa. S3	10.80
Warren,O. R2	10.80

STRIP, Cold-Finished Spring Steel (Annealed)

	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Baltimore T6	9.50	10.70	12.90	15.90	18.85
Boston T6	9.50	10.70	12.90	15.90	18.85
Bristol,Conn. W1	...	10.70	12.90	16.10	19.30
Carnegie,Pa. S18	8.95	10.40	12.60	15.60	....
Cleveland A7	8.95	10.40	12.60	15.60	18.55
Dearborn,Mich. D3	9.05	10.50	12.70	....	....
Detroit D2	9.05	10.50	12.70	15.70	....
Dover,O. G6	8.95	10.40	12.60	15.60	18.55
Evanston,Ill. M22	8.95	10.40	12.60	15.60	....
Farrell,Pa. S3	8.95	10.40	12.60	15.60	18.55
Fostoria,O. S1	10.05	10.40	12.60	15.60	....
FranklinPark,Ill. T6	9.05	10.40	12.60	15.60	18.55
Harrison,N.J. C18	....	....	12.90	16.10	19.30
Indianapolis J5	9.10	10.55	12.60	15.60	18.55
LosAngeles C1	11.15	12.60	14.80	17.80	....
LosAngeles J5	11.15	12.60	14.80	....	....
NewBritain,Conn. S15	9.40	10.70	12.90	15.90	18.85
NewCastle,Pa. B4, E5	8.95	10.40	12.60	15.60	....
NewHaven,Conn. D2	9.40	10.70	12.90	15.90	....
NewKensington,Pa. A6	8.95	10.40	12.60	15.60	....
New York W3	....	10.70	12.90	16.10	19.30
Pawtucket,R.I. N8	9.50	10.70	12.90	15.90	18.85
Riverdale,Ill. A1	9.05	10.40	12.60	15.60	18.55
Rome,N.Y.(32) R6	8.95	10.40	12.60	15.60	18.55
Sharon,Pa. S3	8.95	10.40	12.60	15.60	18.55
Trenton,N.J. R5	....	10.70	12.90	15.90	18.85
Wallingford,Conn. W2	9.40	10.70	12.90	15.90	18.75
Warren,O. T5	8.95	10.40	12.60	15.60	18.55
Worcester,Mass. A7, T6	9.50	10.70	12.90	15.90	18.85
Youngstown J5	8.95	10.40	12.60	15.60	18.55

Spring Steel (Tempered)

			Up to 0.80C	0.81-1.05C	1.06-1.35C
Bristol,Conn. W1	...	...	18.85	22.95	27.80
Buffalo W12	...	...	18.25	....	....
Fostoria,O. S1	...	...	19.05	22.15	....
FranklinPark,Ill. T6	...	...	19.20	23.30	28.15
Harrison,N.J. C18	...	...	18.85	22.95	27.80
NewYork W3	...	...	18.85	22.95	27.80
Palmer,Mass. W12	...	...	18.85	....	....
Trenton,N.J. R5	...	...	18.85	22.95	27.80
Worcester,Mass. A7, T6	...	...	18.85	22.95	27.80
Youngstown J5	...	...	18.45	22.30	26.65

TIN MILL PRODUCTS

TIN PLATE, Electrolytic (Base Box)

	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$8.75	$9.00	$9.40
Fairfield,Ala. T2	8.85	9.10	9.50
Fairless,Pa. U5	8.85	9.10	9.50
Fontana,Calif. K1	9.50	9.75	10.15
Gary,Ind. U5	8.75	9.00	9.40
GraniteCity,Ill. G4	8.85	9.10	9.50
IndianaHarbor,Ind. I-2, Y1	8.75	9.00	9.40
Irvin,Pa. U5	8.75	9.00	9.40
Niles,O. R2	8.75	9.00	9.40
Pittsburg,Calif. C11	9.50	9.75	10.15
SparrowsPoint,Md. B2	8.85	9.10	9.50
Yorkville,O. W10	8.75	9.00	9.40

ELECTROTIN (22-27 Gage; Dollars per 100 lb)

Aliquippa,Pa. J5	7.725	7.925	....
Niles,O. R2	7.725	7.925	8.125

TIN PLATE, American

	1.25 lb	1.50 lb
Aliquippa,Pa. J5	$10.05	$10.30
Fairfield,Ala. T2	10.15	10.40
Fairless,Pa. U5	10.15	10.40
Fontana,Calif. K1	10.80	11.05
Gary,Ind. U5	10.05	10.30
Ind.Harb. Y1	10.05	10.30
Pitts.,Calif. C11	10.80	11.05
Sp.Pt.,Md. B2	10.15	10.40
Weirton,W.Va. W6	10.05	10.30
Yorkville,O. W10	10.05	10.30

BLACK PLATE (Base Box)

Aliquippa,Pa. J5	$7.85
Fairfield,Ala. T2	7.95
Fairless,Pa. U5	7.95
Fontana,Calif. K1	8.60
Gary,Ind. U5	7.85
GraniteCity,Ill. G4	7.95
Ind.Harbor,Ind. I-2, Y1	7.85
Irvin,Pa. U5	7.85
Niles,O. R2	7.85
Pittsburg,Calif. C11	8.60
SparrowsPoint,Md. B2	7.95
Weirton,W.Va. W6	7.85
Yorkville,O. W10	7.85

HOLLOWARE ENAMELING Black Plate (29 Gage)

Aliquippa,Pa. J5	7.50
Gary,Ind. U5	7.50
GraniteCity,Ill. G4	7.60
Ind.Harbor,Ind. Y1	7.50
Irvin,Pa. U5	7.50
Yorkville,O. W10	7.50

MANUFACTURING TERNES (Special Coated, Base Box)

Gary,Ind. U5	$9.70
Irvin,Pa. U5	9.70

ROOFING SHORT TERNES (8 lb Coated, Base Box)

Gary,Ind. U5	$11.25

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2	8.175

STRIP, C.R. Electrogalvanized

Cleveland A7	*7.425*
Dover,O. G6	7.425*
Evanston,Ill. M22	7.525*
Riverdale,Ill. A1	7.525*
Warren,O. B9, S3, T5	7.425*
Worcester,Mass. A7	*7.975*
Youngstown J5	7.15*

*Plus galvanizing extras.

STRIP, Galvanized (Continuous)

Farrell,Pa. S3	7.50
Sharon,Pa. S3	7.50

TIGHT COOPERAGE HOOP

Atlanta A11	5.65
Farrell,Pa. S3	5.525
Riverdale,Ill. A1	5.675
Sharon,Pa. S3	5.525
Youngstown U5	5.525

SILICON STEEL

COILS & CUT LENGTHS (22 Ga.)

Fully Processed (Semiprocessed ½c lower)	Field	Armature	Electric	Motor	Dynamo
BeechBottom,W.Va. W10	....	11.70	12.40	13.55	14.65
Brackenridge,Pa. A4	....	....	12.40	13.55	14.65
GraniteCity,Ill. G4	9.975*	11.30*	12.00*	13.15*	....
IndianaHarbor,Ind. I-2	9.875*	11.20*	11.90*	13.05*	....
Mansfield,O. E6	9.875*	11.70	12.40	13.55	14.65
Newport,Ky. A2	9.875	11.70*	12.40*	13.55*	14.65*
Niles,O. M21	9.875*	11.70	12.40	13.55	....
Vandergrift,Pa. U5	9.875*	11.70	12.40	13.55	14.65
Warren,O. R2	9.875*	11.70	12.40	13.55	14.65
Zanesville,O. A10	....	11.70†	12.40	13.55	14.65

	Stator
Vandergrift,Pa. U5	8.10
Mansfield,O. E6	8.10

SHEETS (22 Ga., coils & cut lengths)

Fully Processed (Semiprocessed ½c lower)	T-72	T-65	T-58	T-52
BeechBottom,W.Va. W10	15.70	16.30	16.80	17.85
Vandergrift,Pa. U5	15.70	16.30	16.80	17.85
Zanesville,O. A10	15.70	16.30	16.80	17.85

C.R. COILS & CUT LENGTHS (22 Ga.)

	Grain Oriented T-100	T-90	T-80	T-73	T-66	T-72
Brackenridge,Pa. A4	....	18.10	19.70	20.20	20.70	15.70††
Butler,Pa. A10	....	....	19.70	20.20	20.70	....
Vandergrift,Pa. U5	17.10	18.10	19.70	20.20	20.70	15.70
Warren,O. R2	....	....	....	....	....	15.70‡

*Semiprocessed. †Fully processed only. ‡Coils, annealed, semiprocessed ½c lower. ††Coils only.

WIRE

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2	8.00
Aliquippa,Pa. J5	8.00
Alton,Ill. L1	8.20
Atlanta A1	8.00
Bartonville,Ill. K4	8.10
Buffalo W12	8.00
Chicago W13	8.00
Cleveland A7, C20	8.00
Crawfordsville,Ind. M8	8.10
Donora,Pa. A7	8.00
Duluth A7	8.00
Fairfield,Ala. T2	8.00
Fostoria,O.(24) S1	8.10
Houston S5	8.25
Jacksonville,Fla. M8	8.35
Johnstown,Pa. B2	8.00
Joliet,Ill. A7	8.00
KansasCity,Mo. S5	8.25
Kokomo,Ind. C16	8.10
LosAngeles B3	8.95
Minnequa,Colo. C10	8.25
Monessen,Pa. P7, P16	8.00
Palmer,Mass. W12	8.30
Pittsburg,Calif. C11	8.95
Portsmouth,O. P12	8.00
Rankin,Pa. A7	8.00
S.Chicago,Ill. R2	8.00
S.SanFrancisco C10	8.95
SparrowsPoint,Md. B2	8.10
Sterling,Ill.(1) N15	8.00
Sterling Ill. N15	8.10
Struthers,O. Y1	8.00
Waukegan,Ill. A7	8.00
Worcester,Mass. A7	8.30

WIRE, Cold Heading Carbon

Elyria,O. W8	8.00

WIRE, Gal'd., for ACSR

Bartonville,Ill. K4	12.65
Buffalo W12	13.40
Cleveland A7	*13.40*
Donora,Pa. A7	*13.40*
Duluth A7	*13.40*
Johnstown,Pa. B2	*13.40*
Minnequa,Colo. C10	13.525
Monessen,Pa. P16	12.65
Monessen,Pa. P7	13.40
Muncie Ind. I-7	13.60
NewHaven,Conn. A7	*13.70*
Palmer,Mass. W12	13.70
Pittsburg,Calif. C11	13.45
Portsmouth,O. P12	12.65
Roebling,N.J. R5	13.70
SparrowsPt.,Md. B2	*13.50*
Struthers,O. Y1	12.65
Trenton,N.J. A7	*13.40*
Waukegan,Ill. A7	*13.40*
Worcester,Mass. A7	*13.70*

WIRE, Upholstery Spring

Aliquippa,Pa. J5	9.75
Alton,Ill. L1	9.95
Buffalo W12	9.75
Cleveland A7	9.75
Donora,Pa. A7	9.75
Duluth A7	9.75
Johnstown,Pa. B2	9.75
KansasCity,Mo. S5	10.00
LosAngeles B3	10.70
Minnequa,Colo. C10	9.95
Monessen,Pa. P7, P16	9.75
NewHaven,Conn. A7	10.05
Palmer,Mass. W12	10.05
Pittsburg,Calif. C11	10.25
Portsmouth,O. P12	9.75
Roebling,N.J. R5	9.60
S.Chicago,Ill. R2	9.75
S.SanFrancisco C10	10.70
SparrowsPt.,Md. B2	9.85
Struthers,O. Y1	9.75
Trenton,N.J. A7	10.05
Waukegan,Ill. A7	9.75
Worcester,Mass. A7	10.05

WIRE, MB Spring, High-Carbon

Aliquippa,Pa. J5	9.75
Alton,Ill. L1	9.95
Bartonville,Ill. K4	9.85
Buffalo W12	9.75
Cleveland A7	9.75
Donora,Pa. A7	9.75
Duluth A7	9.75
Fostoria,O. S1	9.80
Johnstown,Pa. B2	9.75
KansasCity,Mo. S5	10.00
LosAngeles B3	10.70
Milbury,Mass.(12) N6	10.05
Minnequa,Colo. C10	9.95
Monessen,Pa. P7, P16	9.75
Muncie,Ind. I-7	9.95
Palmer,Mass. W12	10.05
Pittsburg,Calif. C11	10.70
Portsmouth,O. P12	9.75
Roebling,N.J. R5	10.05
S.Chicago,Ill. R2	9.75
S.SanFrancisco C10	10.70
SparrowsPt.,Md. B2	9.85
Struthers,O. Y1	9.75
Trenton,N.J. A7	10.05
Waukegan,Ill. A7	9.75
Wor'ster,Mass. A7,J4,T6	10.05

WIRE, Fine & Weaving(8" Coils)

Alton,Ill. L1	15.80
Bartonville,Ill. K4	15.70
Chicago W13	16.30
Cleveland A7	*16.30*
Crawfordsville,Ind. M8	16.40
Fostoria,O. S1	16.30
Houston S5	15.85
Jacksonville,Fla. M8	16.65
Johnstown,Pa. B2	15.60
KansasCity,Mo. S5	15.85
Kokomo,Ind. C16	16.30
Minnequa,Colo. C10	16.55
Monessen,Pa. P16	15.60
Muncie,Ind. I-7	16.50
Palmer,Mass. W12	16.60
S.SanFrancisco C10	17.15
Waukegan,Ill. A7	*16.30*
Worcester,Mass. T6	16.60
Worcester,Mass. A7	*16.60*

WIRE, Tire Bead

Bartonville,Ill. K4	16.55
Monessen,Pa. P16	16.55
Roebling,N.J. R5	17.65

ROPE WIRE (A)

Bartonville,Ill. K4	13.45
Buffalo W12	13.45
Fostoria,O. S1	13.45
Johnstown,Pa. B2	13.45
Monessen,Pa. P7	13.45
Muncie,Ind. I-7	13.65
Palmer,Mass. W12	13.75
Portsmouth,O. P12	13.45
Roebling,N.J. R5	13.75
St.Louis L8	12.75
SparrowsPt.,Md. B2	13.55
Struthers,O. Y1	12.75
Worcester,Mass. J4	13.75

(A) Plow and Mild Plow; add 0.25c for Improved Plow

WIRE, Cold-Rolled Flat

Anderson,Ind. G6	12.35
Baltimore T6	12.65
Boston T6	12.65
Buffalo W12	11.65
Chicago W13	11.75
Cleveland A7	11.65
Crawfordsville,Ind. M8	11.65
Dover,O. G6	12.35
Farrell,Pa. S3	11.65
Fostoria,O. S1	12.35
FranklinPark,Ill. T6	12.45
Kokomo,Ind. C16	11.65
Massillon,O. R8	11.65
Milwaukee C23	12.55
Monessen,Pa. P7, P16	11.65
Palmer,Mass. W12	11.95
Pawtucket,R.I. N8	11.95
Philadelphia P24	12.65
Riverdale,Ill. A1	*12.45*
Rome,N.Y. R6	11.65
Sharon,Pa. S3	11.65
Trenton,N.J. R5	12.65
Warren,O. B9	11.65
Worcester,Mass. A7	11.95
Worcester,Mass. T6	12.65

NAILS, Stock

	Col.
AlabamaCity,Ala. R2	173
Aliquippa,Pa. J5	173
Atlanta A11	175
Bartonville,Ill. K4	175
Chicago W13	173
Cleveland A9	173
Crawfordsville,Ind. M8	175
Donora,Pa. A7	173
Duluth A7	173
Fairfield,Ala. T2	173
Houston S5	178
Jacksonville,Fla. M8	175
Johnstown,Pa. B2	173
Joliet,Ill. A7	173
KansasCity,Mo. S5	178
Kokomo,Ind. C16	175
Minnequa,Colo. C10	178
Monessen,Pa. P7	173
Pittsburg,Calif. C11	192
Rankin,Pa. A7	173
S.Chicago,Ill. R2	173
SparrowsPt.,Md. B2	175
Sterling,Ill.(7) N15	175
Worcester,Mass. A7	179

(To Wholesalers; per cwt)

Galveston,Tex. D7	$9.10

NAILS, Cut (100 lb keg)
To Dealers (33)

Conshohocken,Pa. A3	$10.30
Wheeling,W.Va. W10	9.80

POLISHED STAPLES

	Col.
AlabamaCity,Ala. R2	175
Aliquippa,Pa. J5	175
Atlanta A11	177
Bartonville,Ill. K4	177
Crawfordsville,Ind. M8	177
Donora,Pa. A7	175
Duluth A7	175
Fairfield,Ala. T2	175
Houston S5	180
Jacksonville,Fla. M8	177
Johnstown,Pa. B2	175
Joliet,Ill. A7	175
KansasCity,Mo. S5	180
Kokomo,Ind. C16	177
Minnequa,Colo. C10	180
Pittsburg,Calif. C11	194
Rankin,Pa. A7	175
S.Chicago,Ill. R2	175
SparrowsPt.,Md. B2	177
Sterling,Ill.(7) N15	175
Worcester,Mass. A7	181

TIE WIRE, Automatic Baler (14½ Ga.)(per 97 lb Net Box)
Coil No. 3150

AlabamaCity,Ala. R2	$10.26
Atlanta A11	10.36
Bartonville,Ill. K4	10.36
Buffalo W12	10.26
Chicago W13	10.26
Crawfordsville,Ind. M8	10.36
Donora,Pa. A7	10.26
Duluth A7	10.26
Fairfield,Ala. T2	10.26
Houston S5	10.51
Jacksonville,Fla. M8	10.36
Johnstown,Pa. B2	10.26
Joliet,Ill. A7	10.26
KansasCity,Mo. S5	10.51
Kokomo,Ind. C16	10.36
LosAngeles B3	11.05
Minnequa,Colo. C10	10.51
Pittsburg,Calif. C11	11.04
S.Chicago,Ill. R2	10.26
S.SanFrancisco C10	11.04
SparrowsPt.,Md. B2	10.36
Sterling,Ill.(37) N15	10.36

Coil No. 6500 Stand.

AlabamaCity,Ala. R2	$10.60
Atlanta A11	10.70
Bartonville,Ill. K4	10.70
Buffalo W12	10.60
Chicago W13	10.60
Crawfordsville,Ind. M8	10.70
Donora,Pa. A7	10.60
Duluth A7	10.60
Fairfield,Ala. T2	10.60
Houston S5	10.85
Jacksonville,Fla. M8	10.70
Johnstown,Pa. B2	10.60
Joliet,Ill. A7	10.60
KansasCity,Mo. S5	10.85
Kokomo,Ind. C16	10.70
LosAngeles B3	11.40
Minnequa,Colo. C10	10.85
Pittsburg,Calif. C11	11.40
S.Chicago,Ill. R2	10.60
S.SanFrancisco C10	11.40
SparrowsPt.,Md. B2	10.70
Sterling,Ill.(37) N15	10.70

Coil No. 6500 Interim

AlabamaCity,Ala. R2	$10.65
Atlanta A11	10.75
Bartonville,Ill. K4	10.75
Buffalo W12	10.65
Chicago W13	10.65
Crawfordsville,Ind. M8	10.75
Donora,Pa. A7	10.65
Duluth A7	10.65
Fairfield,Ala. T2	10.65
Houston S5	10.90
Jacksonville,Fla. M8	10.75
Johnstown,Pa. B2	10.65
Joliet,Ill. A7	10.65
KansasCity,Mo. S5	10.90
Kokomo,Ind. C16	10.75
Los Angeles B3	11.45
Minnequa,Colo. C10	10.90
Pittsburg,Calif. C11	11.45
S.Chicago,Ill. R2	10.65
S.SanFrancisco C10	11.45
SparrowsPt.,Md. B2	10.75
Sterling,Ill.(37) N15	10.75

BALE TIES, Single Loop

	Col.
AlabamaCity,Ala. R2	212
Atlanta A11	214
Bartonville,Ill. K4	214
Crawfordsville,Ind. M8	214
Donora,Pa. A7	212
Duluth A7	212
Fairfield,Ala. T2	212
Houston S5	217
Jacksonville,Fla. M8	214
Joliet,Ill. A7	212
KansasCity,Mo. S5	217
Kokomo,Ind. C16	214
Minnequa,Colo. C10	217
Pittsburg,Calif. C11	236
S.SanFrancisco C10	236
SparrowsPt.,Md. B2	214
Sterling,Ill.(7) N15	214

FENCE POSTS

Birmingham C15	172
ChicagoHts.,Ill. C2, I-2	172
Duluth A7	172
Franklin,Pa. F5	172
Johnstown,Pa. B2	172
Marion,O. P11	172
Minnequa,Colo. C10	177
Sterling,Ill.(1) N15	172
Tonawanda,N.Y. B12	172

WIRE, Barbed

	Col.
AlabamaCity,Ala. R2	193**
Aliquippa,Pa. J5	190§
Atlanta A11	198*
Bartonville,Ill. K4	198
Crawfordsville,Ind. M8	198
Donora,Pa. A7	193†
Duluth A7	193†
Fairfield,Ala. T2	193†
Houston S5	198**
Jacksonville,Fla. M8	198
Johnstown,Pa. B2	196§
Joliet,Ill. A7	193†
KansasCity,Mo. S5	198**
Kokomo,Ind. C16	195†
Minnequa,Colo. C10	198**
Monessen,Pa. P7	196§
Pittsburg,Calif. C11	213†
Rankin,Pa. A7	193†
S.Chicago,Ill. R2	193**
S.SanFrancisco C10	213*
SparrowsPoint,Md. B2	198§
Sterling,Ill.(7) N15	198††

WOVEN FENCE, 9-15 Ga.

	Col.
Ala.City,Ala. R2	187**
Aliq'ppa,Pa.9-14½ga.J5	190§
Atlanta A11	192*
Bartonville,Ill. K4	192
Crawfordsville,Ind. M8	192
Donora,Pa. A7	187†
Duluth A7	187†
Fairfield,Ala. T2	187†
Houston S5	192**
Jacksonville,Fla. M8	192
Johnstown,Pa.(43) B2	190§
Joliet,Ill. A7	187†
KansasCity,Mo. S5	192**
Kokomo,Ind. C16	189†
Minnequa,Colo. C10	192**
Pittsburg,Calif. C11	210†
Rankin,Pa. A7	187†
S.Chicago,Ill. R2	187**
Sterling,Ill.(7) N15	192††

WIRE (16 gage)

	Stone	An'ld Galv. Stone
Ala.City,Ala.R2	17.85	19.40**
Aliq'ppa,Pa. J5	17.15	18.95
Bartonville K4	17.25	19.05
Cleveland A7	17.15	....
Craw'dsville M8	17.95	19.65
Fostoria,O. S1	18.35	19.90†
Houston S5	17.40	18.95**
Jacksonville M8	17.95	19.65
Johnstown B2	17.15	18.95§
Kan.City,Mo. S5	17.40	....
Kokomo C16	17.25	18.80†
Minnequa C10	18.10	19.65**
P'lm'r,Mass. W12	18.15	19.70†
Pitts.,Calif. C11	17.50	19.05†
S.SanFran. C10	18.20	19.75**
SparrowsPt. B2	17.25	19.05§
Sterling(37) N15	17.25	19.05††
Waukegan A7	17.15	18.70†
Worcester A7	17.45	....

WIRE, Merchant Quality (6 to 8 gage)

	An'ld Galv.
Ala.City,Ala. R2	9.00 9.55**
Aliquippa J5	8.65 9.325§
Atlanta(48) A11	8.75 9.425*
Bartonville(48) K4	9.10 9.775
Buffalo W12	9.00 9.55†
Cleveland A7	9.00 ....
Crawfordsville M8	9.10 9.775
Donora,Pa. A7	9.00 9.55†
Duluth A7	9.00 9.55†
Fairfield T2	9.00 9.55†
Houston(48) S5	9.25 9.80**
Jacks'ville,Fla. M8	9.10 9.775
Johnstown B2(48)	8.65 9.325§
Joliet,Ill. A7	9.00 9.55†
Kans.City(48) S5	9.25 9.80**
Kokomo(48) C16	9.10 9.65†
LosAngeles B3	9.95 10.625§
Minnequa C10	9.25 9.80**
Monessen P7(48)	8.65 9.325§
Palmer,Mass. W12	9.30 9.85†
Pitts.,Calif. C11	9.95 10.50†
Rankin,Pa. A7	9.00 9.55†
S.Chicago R2	9.00 9.55**
S.SanFran. C10	9.95 10.50**
Spar'wsPt.B2(48)	8.75 9.425§
Sterling(48) N15	9.25 9.925††
Sterling(1) (48)	9.15 9.825††
Struthers,O. Y1	9.00 9.65‡
Worcester,Mass.A7	9.30 9.85†

Based on zinc price of: *13.50. †5c. §10c. ‡Less than 10c. ††10.50c. **Subject to zinc equalization extras.

FASTENERS

(Base discounts, shipments of one to four containers, per cent off list, f.o.b. mill)

BOLTS

Machine Bolts
Full Size Body (cut thread)

½ in. and smaller:	
3 in. and shorter	53.0
3¼ in. thru 6 in.	47.0
Longer than 6 in.	33.0
⅝ in., 3 in. & shorter	44.0
3¼ in. thru 6 in.	37.0
Longer than 6 in.	27.0
¾ in. thru 1 in.:	
6 in. and shorter	33.0
Longer than 6 in.	27.0
1⅛ in. and larger:	
All lengths	27.0

Undersize Body (rolled thread)

½ in. and smaller:	
3 in. and shorter	53.0
3¼ in. thru 6 in.	47.0

Machine Bolts, Hot Galvanized
(Square & Hex, Full & Undersize Body)

½ in. and smaller:	
3 in. and shorter	38.0
3¼ in. thru 6 in.	29.0
Longer than 6 in.	15.0
⅝ in., 3 in. & shorter	27.0
3¼ in. thru 6 in.	17.0
Longer than 6 in.	10.0
¾ in. thru 1 in.:	
6 in. and shorter	18.0
Longer than 6 in.	7.0
1⅛ in. and larger:	
All lengths	7.0

Carriage, Plow & Lag Bolts, Hot Galvanized

½ in. and smaller:	
6 in. and shorter	28.0
Larger diameters and longer lengths	13.0

Carriage Bolts
Full Size Body (cut thread) & Undersize Body (rolled thread)

½ in. and smaller:	
6 in. and shorter	46.0
Larger diameters and longer lengths	32.0

Lag, Plow, Tap, Blank, Step, Elevator, Tire, and Fitting Up Bolts

½ in. and smaller:	
6 in. and shorter	46.0
Larger diameters and longer lengths	32.0

NUTS

(Container quantities and over)

Square Nuts, Reg. & Heavy:

All sizes	56.0

Square Nuts, Reg. & Heavy, Hot Galvanized:

All sizes	41.0

(Full container)

Hex Nuts, Reg. & Heavy Hot Pressed & Cold Punched:

¾ in. and smaller	62.0
⅞ in. to 1½ in., incl.	56.0
1⅝ in. and larger	51.5

Hex Nuts, Semifinished, Heavy (Incl. Slotted):

¾ in. and smaller	62.0
⅞ in. to 1½ in., incl.	56.0
1⅝ in. and larger	51.5

Hex Nuts, Finished (Incl. Slotted and Castellated):

⅞ in. and smaller	65.0
1 in. to 1½ in., incl.	57.0
1⅝ in. and larger	51.5

Semifinished Hex Nuts, Reg. (Incl. Slotted):

⅝ in. and smaller	62.0
¾ in. to ⅞ in., incl.	65.0
1 in. to 1½ in., incl.	57.0
1⅝ in. and larger	51.5

CAP AND SETSCREWS
(Base discounts, packages, per cent off list, f.o.b. mill)

Hex Head Capscrews, Coarse or Fine Thread, Bright:

6 in. and shorter:	
⅝ in. and smaller	35.0
¾, ⅞, and 1 in.	16.0
Longer than 6 in.:	
⅝ in. and smaller	3.0
¾, ⅞, and 1 in.	+11.0

High Carbon, Heat Treated:

6 in. and shorter:	
⅝ in. and smaller	20.0
¾, ⅞, and 1 in.	+ 5.0
Longer than 6 in.:	
⅝ in. and smaller	+19.0
¾, ⅞, and 1 in.	+39.0

Flat Head Capscrews:

¾ in. and smaller, 6 in. and shorter	+85.0

Setscrews, Square Head, Cup Point, Coarse Thread:

Through 1 in. diam.:	
6 in. and shorter	+ 5.0
Longer than 6 in.	+29.0

RIVETS

F.o.b. Cleveland and/or freight equalized with Pittsburgh, f.o.b. Chicago and/or freight equalized with Birmingham except where equalization is too great. Structural ½ in., larger 12.85 7/8 in. and smaller by 6 in. and shorter: 15.0%

PRESTRESSED STRAND

(High strength, stress relieved; 7 wire uncoated. Net prices per 1000 ft, 40,000 lb and over)

	Strand Diameter, Inches 1/4	5/16	3/8	7/16	1/2
Alton,Ill. L1	$32.15	$48.20	$61.55	$81.10	$105.65
Buffalo W12	32.15	48.20	61.55	81.10	105.65
Cleveland A7	32.15	48.20	61.55	81.10	....
KansasCity,Mo. U3	32.15	48.20	61.55	81.10	105.65
Monessen,Pa. P16	32.15	48.20	61.55	81.10	105.65
NewHaven,Conn. A7	32.15	48.20	61.55	81.10	105.65
Pittsburg,Calif. C11	....	48.20	61.55	81.10	....
Pueblo,Colo. W12	32.15	48.20	61.55	81.10	105.65
Roebling,N.J. R5	32.15	48.20	61.55	81.10	105.65
St.Louis L8	32.15	48.20	61.55	81.10	105.65
Waukegan,Ill. A7	32.15	48.20	61.55	81.10	105.65

RAILWAY MATERIALS

Rails	Standard No. 1	Standard No. 2	Tee Rails All No. 2	Tee Rails 60 lb Under
Bessemer,Pa. U5	5.75	5.65	....	6.725
Ensley,Ala. T2	5.75	5.65	....	6.725
Fairfield,Ala. T2	....	....	....	6.725
Gary,Ind. U5	5.75	5.65	....	....
Huntington,W.Va. C15	....	....	....	6.50
Johnstown,Pa. B2	....	....	....	(16)6.725
Lackawanna,N.Y. B2	5.75	5.65	....	6.725
Minnequa,Colo. C10	*5.75*	*5.65*	....	*7.22*
Steelton,Pa. B2	5.75	5.65	....	....
Williamsport,Pa. S19	....	....	....	6.725

TIE PLATES

Fairfield,Ala. T2	6.875
Gary,Ind. U5	6.875
Lackawanna,N.Y. B2	6.60
Minnequa,Colo. C10	*6.875*
Seattle B3	6.75
Steelton,Pa. B2	6.60
Torrance,Calif. C11	6.875

JOINT BARS

Bessemer,Pa. U5	7.25
Fairfield,Ala. T2	7.25
Joliet,Ill. U5	7.25
Lackawanna,N.Y. B2	7.25
Minnequa,Colo. C10	*7.25*
Steelton,Pa. B2	7.25

AXLES

Ind.Harbor,Ind. S13	9.125
Johnstown,Pa. B2	9.125

TRACK BOLTS, Untreated

Cleveland R2	15.35
KansasCity,Mo. S5	15.35
Lebanon,Pa. B2	15.35
Minnequa,Colo. C10	*15.35*
Pittsburgh P14	14.75
Seattle B3	15.85

SCREW SPIKES

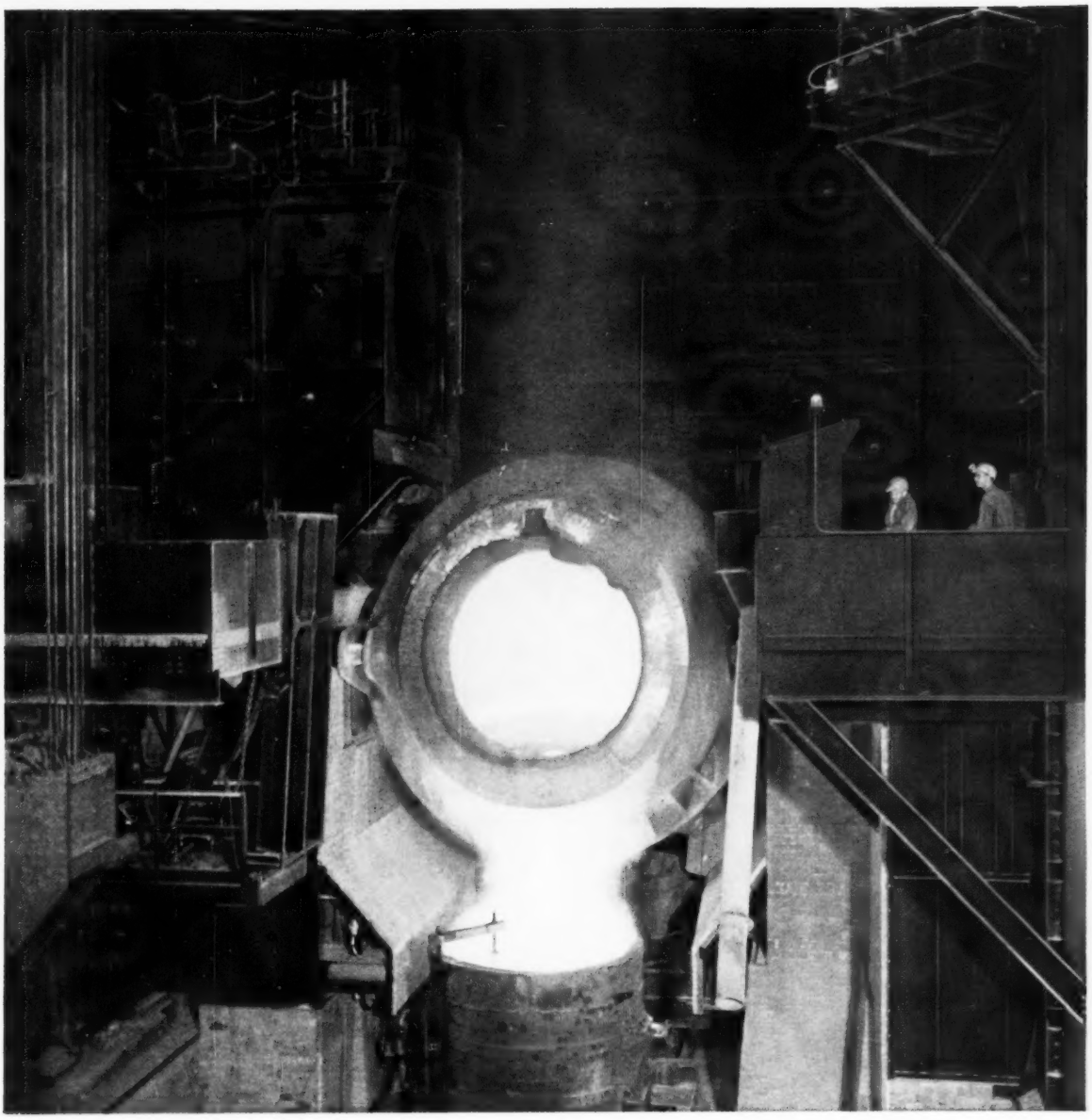
Lebanon,Pa. B2	15.10

STANDARD TRACK SPIKES

Fairfield,Ala. T2	9.75
Ind.Harbor,Ind. I-2, Y1	10.10
KansasCity,Mo. S5	10.10
Lebanon,Pa. B2	9.75
Minnequa,Colo. C10	*10.10*
Pittsburgh J5	10.10
Seattle B3	10.60
S.Chicago,Ill. R2	10.10
Struthers,O. Y1	10.10
Youngstown R2	10.10

Footnotes

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(5) 1½ to under 1 7/16 in.; 1 7/16 to under 1 15/16 in., 6.70c; 1 15/16 to 8 in., inclusive, 7.05c.
(6) Chicago or Birm. Base.
(7) Chicago base 2 cols. lower.
(8) 16 Ga. and heavier.
(9) Merchant quality; add 0.35c for special quality.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass., base.
(13) Add 0.25c for 17 Ga. & heavier.
(14) Gage 0.143 to 0.249 in.; for gage 0.142 and lighter, 5.80c.
(15) ¾" and thinner.
(16) 40 lb and under.
(17) Flats only; 0.25 in. & heavier.
(18) To dealers.
(19) Chicago & Pitts. base.
(21) New Haven, Conn. base.
(22) Deld. San Francisco Bay area.
(23) Special quality.
(24) Deduct 0.05c, finer than 15 Ga.
(25) Bar mill bands.
(26) Deld. in mill zone, 6.295c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Youngstown base.
(30) Sheared; for universal mill add 0.45c.
(31) Widths over ⅝ in.; 7.875c, for widths ⅝ in. and under by 0.125 in. and thinner.
(32) Buffalo base.
(33) To jobbers, deduct 20c.
(34) 9.60c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) Chicago base, 10 points lower.
(38) 14 Ga. & lighter; 48" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.25c higher.
(41) 9.10c for cut lengths.
(42) Mill lengths, f.o.b. mill; deld. in mill zone or within switching limits, 5.685c.
(43) 9-14½ Ga.
(44) To fabricators.
(48) 6-7 Ga.
(49) 3½ in. and smaller rounds; 9.65c, over 3½ in. and other shapes.



McLOUTH DOUBLES OXYGEN STEEL CAPACITY

The vessel shown above produces 90 ton heats of Oxygen Steel. Two of these vessels—the largest producing in the world—have been added to the original Oxygen Steel making equipment and are a vital part of the expansion program at McLouth's Trenton, Michigan plant.

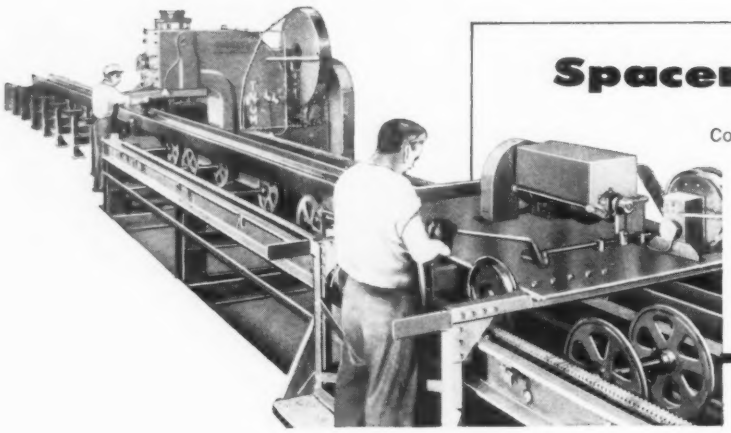
Ever since McLouth pioneered the first Oxygen Steel Process in the United States, we have continued to expand and improve our manufacturing facilities to bring you better steels for the product you make today . . . and the product you plan for tomorrow.

McLOUTH STEEL CORPORATION Detroit 17, Michigan

Manufacturers of high quality stainless and carbon steels.

the trend is to THOMAS *for*

PUNCHING and SHEARING

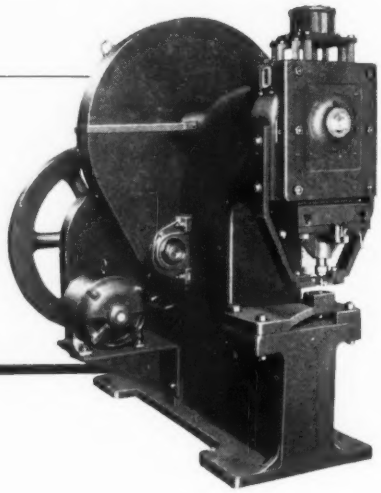


Spacer Punching

Complete elimination of layout costs is a major saving when Thomas Spacing Machines—either Motorized Indicator or Full Automatic — are used. Additional advantages are greatly reduced material handling; faster punching and greater accuracy.

Detail Punching

Thomas builds Detail Punches in a wide range of sizes. These, too, have all the modern design features such as Push Button Clutch Control; Anti-Friction Bearings; Steel Gears and Air Counterbalance.



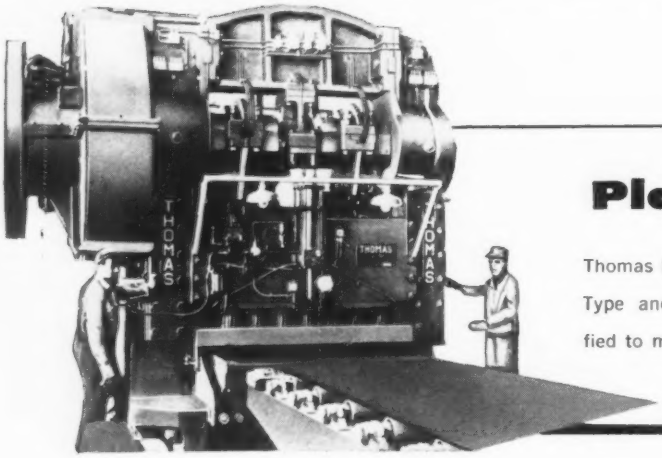


Plate Shearing

Thomas Plate Shears are of the Heavy Duty Mill Type and are individually designed or modified to meet individual customers' requirement.

Thomas also builds BAR Shears, BILLET Shears, Double ANGLE Shears, Wall DRILLS and other machines for the structural fabricator.

THOMAS
MACHINE MANUFACTURING CO.
PITTSBURGH 23, PA.

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SEAMLESS STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	2		2½		3		3½		4		5		6	
List Per Ft	37c		58.5c		76.5c		92c		$1.09		$1.48		$1.92	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	+12.25	+27.25	+5.75	+22.5	+3.25	+20	+1.75	+18.5	+1.75	+18.5	+2	+18.75	0.5	+16.25
Ambridge, Pa. N2	+12.25	....	+5.75	....	+3.25	....	+1.75	....	+1.75	....	+2	....	0.5	....
Lorain, O. N3	+12.25	+27.25	+5.75	+22.5	+3.25	+20	+1.75	+18.5	+1.75	+18.5	+2	+18.75	0.5	+16.25
Youngstown Y1	+12.25	+27.25	+5.75	+22.5	+3.25	+20	+1.75	+18.5	+1.75	+18.5	+2	+18.75	0.5	+16.25

ELECTRICWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Youngstown R2	+12.25	+27.25	+5.75	+22.5	+3.25	+20	+1.75	+18.5	+1.75	+18.5	+2	+18.75	0.5	+16.25

BUTTWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	⅛		¼		⅜		½		¾		1		1¼	
List Per Ft	5.5c		6c		6c		8.5c		11.5c		17c		23c	
Pounds Per Ft	0.24		0.42		0.57		0.85		1.13		1.68		2.28	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	....	....	....	....	....	....	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Alton, Ill. L1	....	....	....	....	....	....	0.25	+15	3.25	+11	6.75	+6.5	9.25	+5.75
Benwood, W. Va. W10	1.5	+25	+10.5	+34	+21	+42.5	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Butler, Pa. F6	4.5	+22	+8.5	+32	+19.5	+41	....	....	....	....	....	....	....	....
Etna, Pa. N2	....	....	....	....	....	....	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Fairless, Pa. N3	....	....	....	....	....	....	0.25	+15	3.25	+11	6.75	+6.5	9.25	+5.75
Fontana, Calif. K1	....	....	....	....	....	....	+10.75	+26	+7.75	+22	+4.25	+17.5	+1.75	+16.75
Indiana Harbor, Ind. Y1	....	....	....	....	....	....	1.25	+14	4.25	+10	7.75	+5.5	10.25	+6.25
Lorain, O. N3	....	....	....	....	....	....	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Sharon, Pa. S4	4.5	+22	+8.5	+32	+19.5	+41	....	....	....	....	....	....	....	....
Sharon, Pa. M6	....	....	....	....	....	....	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Sparrows Pt., Md. B2	0.5	+26	+11.5	+35	+22	+43.5	0.25	+15	3.25	+11	6.75	+6.5	9.25	+5.75
Wheatland, Pa. W9	4.5	+22	+8.5	+32	+19.5	+41	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Youngstown R2, Y1	....	....	....	....	....	....	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75

Size—Inches	1½		2		2½		3		3½		4	
List Per Ft	27.5c		37c		58.5c		76.5c		92c		$1.09	
Pounds Per Ft	2.72		3.68		5.82		7.62		9.20		10.89	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	....	....	....	....
Alton, Ill. L1	9.75	+4.75	10.25	+4.25	11.75	+4.5	11.75	+4.5	1.25	+15.5	1.25	+15.5
Benwood, W. Va. W10	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	3.25	+13.5	3.25	+13.5
Etna, Pa. N2	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	3.25	+13.5	3.25	+13.5
Fairless, Pa. N3	9.75	+4.75	10.25	+4.25	11.75	+4.5	11.75	+4.5	1.25	+15.5	1.25	+15.5
Fontana, Calif. K1	+1.25	+15.75	+0.75	+15.25	0.75	+15.5	0.75	+15.5	+9.75	+26.5	+9.75	+26.5
Indiana Harbor, Ind. Y1	10.75	+3.75	11.25	+3.25	12.75	+3.5	12.25	+3.5	2.25	+14.5	2.25	+14.5
Lorain, O. N3	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	....	....	....	....
Sharon, Pa. M6	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	....	....	....	....
Sparrows Pt., Md. B2	9.75	+4.75	10.25	+4.25	11.75	+4.5	11.75	+4.5	1.25	+15.5	1.25	+15.5
Wheatland, Pa. W9	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	3.25	+13.5	3.25	+13.5
Youngstown R2, Y1	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	3.25	+13.5	3.25	+13.5

*Galvanized pipe discounts based on current price of zinc (10.00c, East St. Louis).

Stainless Steel

Representative prices, cents per pound; subject to current lists of extras

AISI Type	—Rerolling— Ingot	Slabs	Forging Billets	H.R. Strip	H.R. Rods; C.F. Wire	Bars; Structural Shapes	Plates	Sheets	C.R. Strip; Flat Wire
201	22.00	27.00	....	36.00	40.00	42.00	39.25	48.50	45.00
202	23.75	30.25	36.50	39.00	40.75	43.00	40.00	49.25	49.25
301	23.25	28.00	37.25	37.25	42.00	44.25	41.25	51.25	47.50
302	25.25	31.50	38.00	40.50	42.75	45.00	42.25	52.00	52.00
302B	25.50	32.75	40.75	45.75	45.00	47.25	44.50	57.00	57.00
303	....	32.00	41.00	46.00	45.50	48.00	45.00	56.75	56.75
304	27.00	33.25	40.50	44.25	45.25	47.75	45.75	55.00	55.00
304L	....	....	48.25	51.50	53.00	55.50	53.50	63.25	63.25
305	28.50	36.75	42.50	47.50	45.25	47.75	46.25	58.75	58.75
308	30.75	38.25	47.25	50.25	52.75	55.75	55.25	63.00	63.00
309	39.75	49.50	57.75	64.50	63.75	67.00	66.00	80.50	80.50
310	49.75	61.50	78.00	84.25	86.50	91.00	87.75	96.75	96.75
314	....	....	....	77.50	....	86.50	91.00	87.75	99.00	104.25
316	39.75	49.50	62.25	69.25	69.25	73.00	71.75	80.75	80.75
316L	....	55.50	70.00	76.50	77.00	80.75	79.50	89.25	89.25
317	48.00	60.00	76.75	88.25	86.25	90.75	88.50	101.00	101.00
321	32.25	40.00	47.00	53.50	52.50	55.50	54.75	65.50	65.50
330	....	....	118.75	....	132.00	138.50	135.50	149.25	149.25
18-8 CbTa	37.00	46.50	55.75	63.50	61.50	64.75	64.75	79.25	79.25
403	....	....	28.25	....	32.00	33.75	30.00	40.25	40.25
405	19.50	25.50	29.75	36.00	33.50	35.25	32.50	46.75	46.75
410	16.75	21.50	28.25	31.00	32.00	33.75	30.00	40.25	40.25
416	....	....	28.75	....	32.50	34.25	31.25	48.25	48.25
420	26.00	33.50	34.25	41.75	39.25	41.25	40.25	62.00	62.00
430	17.00	21.75	28.75	32.00	32.50	34.25	31.00	40.75	40.75
430F	....	....	29.50	....	33.00	34.75	31.75	51.75	51.75
431	....	28.75	37.75	....	42.00	44.25	41.00	56.00	56.00
446	....	....	39.25	59.00	44.25	46.50	42.75	70.00	70.00

Stainless Steel Producers Are: Allegheny Ludlum Steel Corp.; American Steel & Wire Div., U. S. Steel Corp.; Anchor Drawn Steel Co., division of Vanadium-Alloys Steel Co.; Armco Steel Corp.; Babcock & Wilcox Co.; Bethlehem Steel Co.; J. Bishop & Co.; A. M. Byers Co.; G. O. Carlson Inc.; Carpenter Steel Co.; Carpenter Steel Co. of New England; Charter Wire Products; Crucible Steel Co. of America; Damascus Tube Co.; Dearborn Div., Sharon Steel Corp.; Wilbur B. Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Corp.; Firth Sterling Inc.; Fort Wayne Metals Inc.; Green River Steel Corp., subsidiary of Jessop Steel Co.; Indiana Steel & Wire Co.; Ingersoll Steel Div., Borg-Warner Corp.; Ellwood Ivins Steel Tube Works Inc.; Jessop Steel Co.; Johnson Steel & Wire Co. Inc.; Stainless & Strip Div., Jones & Laughlin Steel Corp.; Joslyn Stainless Steels, division of Joslyn Mfg. & Supply Co.; Latrobe Steel Co.; Lukens Steel Co.; Maryland Fine & Specialty Wire Co. Inc.; McLouth Steel Corp.; Metal Forming Corp.; Midvale-Heppenstall Co.; National Standard Co.; National Tube Div., U. S. Steel Corp.; Pacific Tube Co.; Page Steel & Wire Div., American Chain & Cable Co. Inc.; Pittsburgh Rolling Mills Inc.; Republic Steel Corp.; Riverside-Alloy Metal Div., H. K. Porter Company Inc.; Rodney Metals Inc.; Sawhill Tubular Products Inc.; Sharon Steel Corp.; Simonds Saw & Steel Co.; Specialty Wire Co. Inc.; Standard Tube Co.; Superior Steel Div., Copperweld Steel Co.; Superior Tube Co.; Swepco Tube Corp.; Techalloy Co. Inc.; Timken Roller Bearing Co.; Trent Tube Co., subsidiary of Crucible Steel Co. of America; Tube Methods Inc.; Ulbrich Stainless Steel Inc.; U. S. Steel Corp.; Universal-Cyclops Steel Corp.; Vanadium-Alloys Steel Co.; Wall Tube & Metal Products Co.; Wallingford Steel Co., subsidiary of Allegheny Ludlum Steel Corp.; Washington Steel Corp.

Clad Steel

	Plates 5%	Plates Carbon Base 10%	Plates Carbon Base 15%	Plates Carbon Base 20%	Sheets Carbon Base 20%
Stainless					
302	....	....	....	....	37.50
304	26.05	28.80	31.55	34.30	39.75
304L	30.50	33.75	36.95	40.15	....
316	38.20	42.20	46.25	50.25	58.25
316L	42.30	46.75	51.20	55.65	....
316 Cb	49.90	55.15	60.40	65.65	....
321	31.20	34.50	37.75	41.05	47.25
347	36.90	40.80	44.65	48.55	57.00
405	22.25	24.60	26.90	29.25	....
410	20.55	22.70	24.85	27.00	....
430	21.20	23.45	25.65	27.90	....
Inconel	48.90	59.55	70.15	80.85	....
Nickel	41.65	51.95	62.30	72.70	....
Nickel, Low Carbon	41.95	52.60	63.30	74.15	....
Monel	43.35	53.55	63.80	74.05	....

	Strip, Carbon Base —Cold Rolled— 10%	Both Sides
Copper*	34.75	40.65

*Deoxidized. Production points: Stainless-clad sheets, New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7, New Castle, Ind. I-4, and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; copper-clad strip, Carnegie, Pa. S18.

Tool Steel

Grade	$ per lb	Grade	$ per lb
Reg. Carbon (W-1)	0.330	W-Cr Hot Work (H-12)	0.530
Spec. Carbon (W-1)	0.385	V-Cr Hot Work (H-13)	0.550
Oil Hardening (O-1)	0.505	W Hot Wk. (H-21)	1.425-1.44
V-Cr-Hot Work (H-11)	0.505	Hi-Carbon-Cr (D-11)	0.955

Grade by Analysis (%) W	Cr	V	Co	Mo	AISI Designation	$ per lb
18	4	1	....	...	T-1	1.840
18	4	2	....	...	T-2	2.005
13.5	4	3	....	...	T-3	2.105
18.25	4.25	1	4.75	...	T-4	2.545
18	4	2	9	...	T-5	2.915
20.25	4.25	1.6	12.25	...	T-6	4.330
13.75	3.75	2	5	...	T-8	2.485
1.5	4	1	....	8.5	M-1	1.200
6.4	4.5	1.9	....	5	M-2	1.345
6	4	3	....	6	M-3	1.590

Tool steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, F2, J3, L3, M14, S8, U4, V2, and V3.

Pig Iron

F.o.b. furnace prices in dollars per gross ton, as reported to STEEL. Minimum delivered prices are approximate.

	Basic	No. 2 Foundry	Malle-able	Besse-mer
Birmingham District				
Birmingham R2	62.00	62.50‡	....	....
Birmingham U6	....	62.50‡	66.50	....
Woodward,Ala. W15	62.00**	62.50‡	66.50	....
Cincinnati, deld.	....	70.20	....	....
Buffalo District				
Buffalo H1, R2	66.00	66.50	67.00	67.50
N.Tonawanda,N.Y. T9	....	66.50	67.00	67.50
Tonawanda,N.Y. W12	66.00	66.50	67.00	67.50
Boston, deld.	77.29	77.79	78.29	....
Rochester,N.Y., deld.	69.02	69.52	70.02	....
Syracuse,N.Y., deld.	70.12	70.62	71.12	....
Chicago District				
Chicago I-3	66.00	66.50	66.50	67.00
S.Chicago,Ill. R2	66.00	66.50	66.50	67.00
S.Chicago,Ill. W14	66.00	....	66.50	67.00
Milwaukee, deld.	69.02	69.52	69.52	70.02
Muskegon,Mich., deld.	....	74.52	74.52	....
Cleveland District				
Cleveland R2, A7	66.00	66.50	66.50	67.00
Akron,Ohio, deld.	69.52	70.02	70.02	70.52
Mid-Atlantic District				
Birdsboro,Pa. B10	68.00	68.50	69.00	69.50
Chester,Pa. P4	68.00	68.50	69.00	....
Swedeland,Pa. A3	68.00	68.50	69.00	69.50
New York, deld.	....	75.50	76.00	....
Newark,N.J., deld.	72.69	73.19	73.69	74.19
Philadelphia, deld.	70.41	70.91	71.41	71.99
Troy,N.Y. R2	68.00	68.50	69.00	69.50
Pittsburgh District				
NevilleIsland,Pa. P6	66.00	66.50	66.50	67.00
Pittsburgh (N&S sides), Aliquippa, deld.	....	67.95	67.95	68.48
McKeesRocks,Pa., deld.	....	67.60	67.60	68.13
Lawrenceville,Homestead, Wilmerding,Monaca,Pa., deld.	....	68.26	68.26	68.79
Verona,Trafford,Pa., deld.	68.29	68.82	68.82	69.35
Brackenridge,Pa., deld.	68.60	69.10	69.10	69.63
Midland,Pa. C18	66.00	....	....	....
Youngstown District				
Hubbard Ohio Y1	....	....	66.50	....
Sharpsville,Pa. S6	66.00	....	66.50	67.00
Youngstown Y1	....	....	66.50	67.00
Mansfield,Ohio, deld.	71.30	....	71.80	72.30
Duluth I-3	66.00	66.50	66.50	67.00
Erie,Pa. I-3	66.00	66.50	66.50	67.00
Everett,Mass. E1	67.50	68.00	68.50	....
Fontana,Calif. K1	75.00	75.50	....	....
Geneva,Utah C11	66.00	66.50	....	....
GraniteCity,Ill. G4	67.90	68.40	68.90	....
Ironton,Utah C11	66.00	66.50	....	....
Minnequa,Colo. C10	68.00	68.50	69.00	....
Rockwood,Tenn. T3	....	62.50‡	66.50	....
Toledo,Ohio I-3	66.00	66.50	66.50	67.00
Cincinnati, deld.	72.94	73.44	....	....

**Phos. 0.70-0.90%; Phos. 0.30-0.69%, $63.
‡Phos. 0.70-0.90%; Phos. 0.30-0.69%, $63.50.

PIG IRON DIFFERENTIALS

Silicon: Add 75 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos. iron on which base is 1.75-2.00%.

Manganese: Add 50 cents per ton for each 0.25% manganese over 1% or portion thereof.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.00-6.50% silicon; add $1 for each 0.50% silicon or portion thereof over the base grade within a range of 6.50 to 11.50%; starting with silicon over 11.50% and $1.50 per ton for each 0.50% silicon or portion thereof up to 14%; add $1 for each 0.50% Mn over 1%)

Jackson,Ohio I-3, J1	$78.00
Buffalo H1	79.25

ELECTRIC FURNACE SILVERY IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1.25 for each 0.50% Mn over 1%; $2 per gross ton premium for 0.045% max P)

CalvertCity,Ky. P15	$99.00
NiagaraFalls,N.Y. P15	99.00
Keokuk,Iowa Open-hearth & Fdry, $9 freight allowed K2	103.50
Keokuk,Iowa O.H. & Fdry, 12½ lb piglets, 16% Si, max fr'gt allowed up to $9, K2	106.50

LOW PHOSPHORUS PIG IRON, Gross Ton

Lyles,Tenn. T3 (Phos. 0.035% max)	$78.50
Rockwood,Tenn. T3 (Phos. 0.035% max)	78.50
Troy,N.Y. R2 (Phos. 0.035% max)	73.00
Philadelphia, deld.	81.67
Cleveland A7 (intermediate) (Phos. 0.036-0.075% max)	71.00
Duluth I-3 (Intermediate) (Phos. 0.036-0.075% max)	71.00
Erie,Pa. I-3 (Intermediate) (Phos. 0.036-0.075% max)	71.00
NevilleIsland,Pa. P6 (Intermediate) (Phos. 0.036-0.075% max)	71.00

Steel Service Center Products

Representative prices, per pound, subject to extras, f.o.b. warehouse. City delivery charges are 15 cents per 100 lb except: Denver, Moline, Norfolk, Richmond, Washington, 20 cents; Baltimore, Boston, Los Angeles, New York, Philadelphia, Portland, Spokane, San Francisco, 10 cents; Atlanta, Birmingham, Chattanooga, Houston, Seattle, no charge.

	SHEETS				STRIP	BARS			Standard Structural Shapes	PLATES	
	Hot-Rolled	Cold-Rolled	Gal. 10 Ga.†	Stainless Type 302	Hot-Rolled*	H.R. Rounds	C.F. Rds.‡	H.R. Alloy 4140††[5]		Carbon	Floor
Atlanta	8.59§	9.86§	10.13	....	8.91	9.39	13.24 #	....	9.40	9.29	10.90
Baltimore	8.00	8.90	10 32	....	8.70	8.65	12 33 #	15.18	8.50	8.65	9.75
Birmingham	8.18	9.45	10 16	....	8 51	8 99	....	....	8 64	8 89	10.99
Boston	9.31	10.40	11.39	53.50	9.73	10.11	13.39 #	15.71	10.01	10.02	11.87
Buffalo	8.25	9.00	11.07	55.98	8.75	9.15	11 49 #	15.40	9.25	9 20	10.75
Chattanooga	8.35	9.69	9 65	....	8 40	8.77	10.46	....	8.88	8.80	10.66
Chicago	8.25	9.45	10.45	53.00	8.51	8.99	9.15	15.05	9.15	8.89	10.20
Cincinnati	8.43	9.51	10.50	52.43	8.83	9.31	11.53 #	15.37	9.56	9.27	10.53
Cleveland	8.36	9.54	10.20	52.33	8.63	9.10	11.25 #	15.16	9.39	9.13	10.44
Dallas	7.50	8.80	....	....	7.65	7.60	11.01	....	7.65	8.10	9.35
Denver	9.40	11.84	12.94	....	9.43	9.80	11.19	....	9.84	9.76	11.08
Detroit	8.51	9.71	10.81	56.50	8.88	9.30	9.51	15.33	9.56	9.26	10.46
Erie, Pa.	8.20	9.45	9.95[10]	....	8.60	9.10	11.25	....	9.35	9.10	10.60
Houston	8.40	8.90	10.29	52.00	8.45	8.40	11.60	15.75	8.35	8.75	10.10
Jackson, Miss.	8.52	9.79	..	....	8.57	8.94	10.68	....	8.97	8.90	10.74
Los Angeles	8.70[2]	10.80[2]	12.15[2]	57.60	9.15	9.10[2]	12.95[2]	16.35	9.00[2]	9.10[3]	11.30[3]
Memphis, Tenn.	8.55	9.80	....	....	8.84	9.32	11.96 #	....	9.33	9.22	10.86
Milwaukee	8.39	9.59	10.59	....	8.65	9.13	9.39	15.19	9.22	9.05	10.34
Moline, Ill.	8.55	9.80	10.45	....	8.58	8.95	9.15	....	8.99	8.91	....
New York	8.87	10.13	10.56	53.08	9.64	9.99	13.25 #	15.50	9.74	9.77	11.05
Norfolk, Va.	8.40	....	....	....	9.10	9.10	12.00	....	9.40	8.85	10.35
Philadelphia	8.00	9.25	11.17	52.69	8.70	8.65	11.50	15.48	8.50	8.75	9.75**
Pittsburgh	8.35	9.55	10 85	52.00	8.61	8.99	11.25 #	15.05	9.00	8.89	10.20
Richmond, Va.	8.40	....	10.40	....	9.10	9.00	....	....	9.40	8.85	10.35
St. Louis	8.63	9.83	10.83	....	8.89	9.37	9.78	15.43	9.48	9.27	10.58
St. Paul	8.79	10.04	10 71	....	8.84	9.21	9.86	....	9.38	9.30	10.49
San Francisco	9.65	11.10	11.00	55.10	9.75	10.15	13.00	16.00	9.85	10.00	12.00
Seattle	8.70	10.30[2]	10.95[2]	55.02	8.75	8.85	14.70	16.80[3]	8.55	8.45	10.85
South'ton, Conn.	9.07	10.33	10.71	....	9.48	9.74	....	....	9.57	9.57	10.91
Spokane	9.95	11.15	12.20	57.38	10.00	10.10	14.70	16.80	9.80	9.70	12.10
Washington	8.88	....	....	....	9.36	9.56	10.94	....	9.79	9.26	10.74

*Prices do not include gage extras; †prices include gage and coating extras; ‡includes 35-cent bar quality extras; §42 in. and under; **⅛ in. and heavier; ††as annealed; ‡‡¾ in. to 4 in. wide, inclusive; #net price, 1 in. round C-1018.

Base quantities, 2000 to 4999 lb except as noted; cold-finished bars, 2000 lb and over except in Seattle, 2000 to 3999 lb; stainless sheets, 8000 lb except in Chicago, New York, Boston, Seattle, 10,000 lb and in San Francisco, 2000 to 4999 lb; hot-rolled products on West Coast, 2000 to 9999 lb, except in Seattle, 30,000 lb and over;; [2]—30,000 lb; [3]—1000 to 4999 lb; [5]—1000 to 1999 lb; [10]—2000 lb and over.

Refractories

Fire Clay Brick (per 1000)

High-Heat Duty: Ashland, Grahn, Hayward, Hitchens, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lock Haven, Lumber, Orviston, West Decatur, Winburne, Snow Shoe, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parrall, Portsmouth, Ohio, Ottawa, Ill., Stevens Pottery, Ga., $140; Salina, Pa., $145; Niles, Ohio, $138; Cutler, Utah, $165.

Super-Duty: Ironton, Ohio, Vandalia, Mo., Olive Hill, Ky., Clearfield, Salina, Winburne, Snow Shoe, Pa., New Savage, Md., St. Louis, $185; Stevens Pottery, Ga., $195; Cutler, Utah, $233.

Silica Brick (per 1000)

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Pt. Matilda, Pa., Portsmouth, Ohio, Hawstone, Pa., $158; Warren, Niles, Windham, Ohio, Hays, Latrobe, Morrisville, Pa., $163; E. Chicago, Ind., Joliet, Rockdale, Ill., $168; Lehigh, Utah, $175; Los Angeles, $180.

Super-Duty: Sproul, Hawstone, Pa., Niles, Warren, Windham, Ohio, Leslie, Md., Athens, Tex., $157; Morrisville, Hays, Latrobe, Pa., $168; E. Chicago, Ind., $167; Curtner, Calif., $182.

Semisilica Brick (per 1000)

Clearfield, Pa., $140; Philadelphia, $137; Woodbridge, N. J., $135.

Ladle Brick (per 1000)

Dry Pressed: Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Vanport, Pa., Mexico, Vandalia, Mo., Wellsville, Irondale, New Salisbury, Ohio, $96.75; Clearfield, Pa., Portsmouth, Ohio, $102.

High-Alumina Brick (per 1000)

50 *Per Cent:* St. Louis, Mexico, Vandalia, Mo. $235; Danville, Ill., $253; Philadelphia, Clearfield, Pa., $230; Orviston, Snow Shoe, Pa., $260.

60 Per Cent: St. Louis, Mexico, Vandalia, Mo., $295; Danville, Ill., $313; Clearfield, Orviston, Snow Shoe, Pa., $320; Philadelphia, $310.

70 Per Cent: St. Louis, Mexico, Vandalia, Mo., $335; Danville, Ill., $353; Clearfield, Orviston, Snow Shoe, Pa., $360; Philadelphia, $350.

Sleeves (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., St. Louis, $188.

Nozzles (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., St. Louis, $310.

Runners (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., $234.

Dolomite (per net ton)

Domestic, dead-burned, bulk, Billmeyer, Blue Bell, Williams, Pymouth Meeting, York, Pa., Millville, W. Va., Bettsville, Millersville, Martin, Woodville, Gibsonburg, Narlo, Ohio, $16.75; Thornton, McCook, Ill., $17; Dolly Siding, Bonne Terre, Mo., $15.60.

Magnesite (per net ton)

Domestic, dead-burned, ½ in. grains with fines: Chewelah, Wash., Luning, Nev., $46; ⅜ in. grains with fines: Baltimore, $73.

Fluorspar

Metallurgical grades, f.o.b. shipping point in Ill., Ky., net tons, carloads, effective CaF_2 content 72.5%, $37-$41; 70%, $36-$40; 60%, $33-$36.50. Imported, net tons, f.o.b. cars point of entry, duty paid, metallurgical grade: European, $29-$31, contract; Mexican, all rail, duty paid, $25; barge, Brownsville, Tex., $26.

Metal Powder

(Per pound f.o.b. shipping point in ton lots for minus 100 mesh, except as noted)

	Cents
Sponge Iron, Swedish: deld. east of Mississippi River, ocean bags 23,000 lb and over.. F.o.b. Riverton or Camden, N. J., west of Mississippi River.	10.50 9.50
Sponge Iron, Domestic, 98 + % Fe: Deld. east of Mississippi River, 23,000 lb and over	10.50
Electrolytic Iron: Melting stock, 99.9% Fe, irregular fragments of ⅛ in. x 1.3 in.	28.00
Annealed, 99.5% Fe..	36.50
Unannealed (99 + % Fe)	36.00
Unannealed (99 + % Fe) (minus 325 mesh)	59.00
Powder Flakes (minus 16, plus 100 mesh)..	29.00
Carbonyl Iron: 98.1-99.9%, 3 to 20 microns, depending on grade. 93.00-290.00 in standard 200-lb containers; all minus 200 mesh.	
Aluminum: Atomized, 500-lb drum, freight allowed Carlots	39.50
Ton lots	41.50
Antimony, 500-lb lots	42.00*
Brass, 5000-lb lots	31.00-46.70†
Bronze, 5000-lb lots	47.20-51.50†
Copper: Electrolytic	14.75*
Reduced	14.75*
Lead	7.50*
Manganese: Minus 35 mesh	64.00
Minus 100 mesh	70.00
Minus 200 mesh	75.00
Nickel, unannealed	74.00
Nickel-Silver, 5000-lb lots	48.80-53.50†
Phosphor-Copper, 5000-lb lots	59.30
Copper (atomized) 5000-lb lots	39.80-48.30†
Silicon	47.50
Solder	7.00*
Stainless Steel, 304	$1.07
Stainless Steel, 316	$1.26
Tin	14.50*
Zinc, 5000-lb lots	17.50-30.70‡
Tungsten: Melting grade, 99% 60 to 200 mesh, nominal; 1000 lb and over	Dollars 3.15
Less than 1000 lb	3.30
Chromium, electrolytic 99.8% Cr min metallic basis	5.00

*Plus cost of metal. †Depending on composition. ‡Depending on mesh.

Electrodes

Threaded with nipple; unboxed, f.o.b. plant

GRAPHITE

Diam	Length	Per 100 lb
2	24	$60.75
2½	30	39.25
3	40	37.00
4	40	35.00
5⅛	40	34.75
6	60	31.50
7	60	28.25
8, 9, 10	60	28.00
12	72	26.75
14	60	26.75
16	72	25.75
17	60	26.25
18	72	26.25
20	72	25.25
24	84	26.00

CARBON

8	60	13.30
10	60	13.00
12	60	12.95
14	60	12.85
14	72	11.95
17	60	11.85
17	72	11.40
20	84	11.40
20	90	11.00
24	72, 84	11.25
24	96	10.95
30	84	11.05
40, 35	110	10.70
40	100	10.70

Imported Steel

(Base per 100 lb, landed, duty paid, based on current ocean rates. Any increase in these rates is for buyer's account. Source of shipment: Western continental European countries.)

	North Atlantic	South Atlantic	Gulf Coast	West Coast
Deformed Bars, Intermediate, ASTM-A 305	$5.30	$5.30	$5.30	$5.50
Bar Size Angles	5.05	5.05	5.05	5.42
Structural Angles	5.05	5.05	5.05	5.42
I-Beams	5.11	5.11	5.11	5.45
Channels	5.11	5.11	5.11	5.45
Plates (basic bessemer)	6.62	6.62	6.62	6.94
Sheets, H.R.	8.20	8.20	8.20	8.50
Sheets, C.R. (drawing quality)	8.75	8.75	8.75	9.12
Furring Channels, C.R., 1000 ft, ⅞ x 0.30 lb per ft	25.71	25.59	25.59	26.46
Barbed Wire (†)	6.65	6.65	6.65	7.00
Merchant Bars	6.07	6.07	6.07	6.43
Hot-Rolled Bands	7.15	7.15	7.15	7.55
Wire Rods, Thomas Commercial No. 5	6.50	6.50	6.50	6.90
Wire Rods, O.H. Cold Heading Quality No. 5	7.07	7.07	7.07	7.47
Bright Common Wire Nails (‡)	8.02	8.02	7.92	8.20

†Per 82 lb net reel. ‡Per 100-lb kegs, 20d nails and heavier.

Ores

Lake Superior Iron Ore

(Prices effective for the 1958 shipping season, gross ton, 51.50% iron natural, rail of vessel, lower lake ports.)

Mesabi bessemer	$11.60
Mesabi nonbessemer	11.45
Old Range bessemer	11.85
Old Range nonbessemer	11.70
Open-hearth lump	12.70
High phos	11.45

The foregoing prices are based on upper lake rail freight rates, lake vessel freight rates, handling and unloading charges, and taxes thereon, which were in effect Jan. 30, 1957, and increases or decreases after that date are absorbed by the seller.

Eastern Local Iron Ore

Cents per unit, deld. E. Pa.

New Jersey, foundry and basic 62-64% concentrates	18.00-19.00

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 65%	25.00
N. African hematite (spot)	nom
Brazilian iron ore, 68.5%	26.00

Tungsten Ore

Net ton, unit

Foreign wolframite, good commercial quality	$8.50-9.00*
Domestic, concentrates f.o.b. milling points	17.00-22.00

*Before duty.

Manganese Ore

Mn 46-48%, Indian (export tax included) $1.10 per long ton unit, c.i.f. U. S. ports, duty for buyer's account; other than Indian, nominal; contracts by negotiation.

Chrome Ore

Gross ton, f.o.b. cars New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., Tacoma, Wash.

Indian and Rhodesian

48% 3:1	$42.00-44.00
48% 2.8:1	38.00-40.00
48% no ratio	29.00-31.00

South African Transvaal

48% no ratio	$29.00-31.00
44% no ratio	22.00-23.00

Turkish

48% 3:1	$51.00-55.00

Domestic

Rail nearest seller

48% 3:1	39.00

Molybdenum

Sulfide concentrate, per lb of Mo content, mines, unpacked	$1.23

Antimony Ore

Per short ton unit of Sb content, c.i.f. seaboard

50-55%	$2.25-2.40
60-65%	2.50-3.10

Vanadium Ore

Cents per lb V_2O_5

Domestic	31.00

Metallurgical Coke

Price per net ton

Beehive Ovens

Connellsville, Pa., furnace	$14.75-15.75
Connellsville, Pa., foundry	18.00-18.50

Oven Foundry Coke

Birmingham, ovens	$28.85
Cincinnati, deld.	31.84
Buffalo, ovens	30.50
Camden, N. J., ovens	29.50
Detroit, ovens	30.50
Pontiac, Mich., deld.	32.45
Saginaw, Mich., deld.	34.03
Erie, Pa., ovens	30.50
Everett, Mass., ovens: New England, deld.	31.55*
Indianapolis, ovens	29.75
Ironton, Ohio, ovens	29.00
Cincinnati, deld.	31.84
Kearny, N. J., ovens	29.75
Milwaukee, ovens	30.50
Neville Island (Pittsburgh), Pa., ovens	29.25
Painesville, Ohio, ovens	30.50
Cleveland, deld.	32.69
Philadelphia, ovens	29.50
St. Louis, ovens	31.50
St. Paul, ovens	29.75
Chicago, deld.	33.29
Swedeland, Pa., ovens	29.50
Terre Haute, Ind., ovens	29.75

*Or within $5.15 freight zone from works

Coal Chemicals

Spot, cents per gallon, ovens

Pure benzene	36.00
Toluene, one deg	29.50
Industrial xylene	32.00-34.00

Per ton, bulk, ovens

Ammonium sulfate	$32.00-34.00

Cents per pound, producing point

Phenol: Grade 1, 17.50; Grade 2-3, 15.50; Grade 4, 17.50; Grade 5, 16.50; Grade 6, 14.50.

Ferroalloys

MANGANESE ALLOYS

Spiegeleisen: Carlot, per gross ton, Palmerton, Neville Island, Pa. 21-23% Mn, $105; 19-21% Mn, 1-3% Si, $102.50; 16-19% Mn, $100.50.

Standard Ferromanganese: (Mn 74-76%, C 7% approx) base price per net ton, $245, Johnstown, Duquesne, Sheridan, Neville Island, Pa.; Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. Add or subtract $2 for each 1% or fraction thereof of contained manganese over 76% or under 74%, respectively. (Mn 79-81%). Lump $253 per net ton, f.o.b. Anaconda or Great Falls, Mont. Add $2.60 for each 1% above 81%; subtract $2.60 for each 1% below 79%, fractions in proportion to nearest 0.1%.

High-Grade Low-Carbon Ferromanganese: (Mn 85-95%). Carload, lump, bulk, max 0.07% C, 35.1c per lb of contained Mn, carload packed 36.4c, ton lots 37.9c, less ton 39.1c. Delivered. Deduct 1.5c for max 0.15% C grade from above prices, 3c for max 0.03% C, 3.5c for max 0.5% C, and 6.5c for max 75% C—max 7% Si. **Special Grade:** (Mn 90% min, C 0.07% max, P 0.06% max). Add 2.05c to the above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.25-1.5%, Si 1.5% max). Carload, lump, bulk, 25.5c per lb of contained Mn, packed, carload 26.8c, ton lot 28.4c, less ton 29.6c. Delivered. Spot, add 0.25c.

Manganese Metal: 2" x D (Mn 95.5% min, Fe 2% max, Si 1% max, C 0.2%). Carload, lump, bulk, 45c per lb of metal; packed, 45.75c; ton lot 47.25c; less ton lot 49.25c. Delivered. Spot, add 2c.

Electrolytic Manganese Metal: Min carload, 34c; 2000 lb to min carload, 36c; less ton, 38c; 50 lb cans, add 0.5c per lb. Premium for hydrogen-removed metal, 0.75c per lb. Prices are f.o.b. cars, Knoxville, Tenn., freight allowed to St. Louis or any point east of Mississippi; or f.o.b. Marietta, O., freight allowed.

Silicomanganese: (Mn 65-68%). Carload, lump, bulk 1.50% C grade, 18-20% Si, 12.8c per lb of alloy. Packed, c.l. 14c, ton 14.45c, less ton 15.45c, f.o.b. Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. For 2% C grade, Si 15-17%, deduct 0.2% from above prices. For 3% C grade, Si 12-14.5%, deduct 0.4c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max, Si 4% max, C 0.10% max). Contract, ton lot, 2" x D, $1.50 per lb of contained Ti; less ton $1.55. (Ti 38-43%, Al 8% max, Si 4% max, C 0.10% max). Ton lot $1.35, less ton $1.37, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract c.l. $240 per ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi River and north of Baltimore and St. Louis. Spot, $245.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 2-4%). Contract c.l. $290 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed. Spot, $295.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l. lump, bulk 28.75c per lb of contained Cr; c.l. packed 30.30c, ton lot 32.05c; less ton 33.45c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: Cr 63-66% (Simplex), carload, lump, bulk, C 0.025% max, 36.75c per lb contained Cr; 0.010% max, 37.75c. Ton lot, add 3.5c; less ton, add 5.2c. Delivered.

Cr 67-71%, carload, lump, bulk, C 0.02% max, 41.00c per lb contained Cr; 0.025% max, 39.75c; 0.05% max, 39.00c; 0.10% max, 38.50c; 0.20% max, 38.25c; 0.50% max, 38.00c; 1.0% max, 37.75c; 1.5% max, 37.50c; 2.0% max, 37.25c. Ton lot, add 3.4c; less ton lot, add 5.1c. Delivered.

Foundry Ferrochrome, High-Carbon: (Cr 61-66%, C 5-7%, Si 7-10%). Contract, c.l., 2 in. x D, bulk 30.05c per lb of contained Cr. Packed, c.l. 31.65c, ton 33.45c, less ton 34.95c. Delivered. Spot, add 0.25c.

Foundry Ferrosilicon Chrome: (Cr 50-54%, Si 28-32%, C 1.25% max). Contract, carload packed, 8M x D, 21.25c per lb of alloy, ton lot 22.50c; less ton lot 23.70c. Delivered. Spot, add 0.25c.

Ferrochrome-Silicon: Cr 39-41%, Si 42-45%, C 0.05% max or Cr 33-36%, Si 45-48%, C 0.05% max. Carload, lump, bulk, 3" x down and 2" x down, 27.50c per lb contained Cr, 14.20c per lb contained Si, 0.75" x down, 28.65c per lb contained Cr, 14.20c per lb contained Si. Delivered.

Chromium Metal, Electrolytic: Commercial grade (Cr 99.8% min, metallic basis, Fe 0.2% max). Contract, carlot, packed 2" x D plate (about ⅜" thick) $1.29 per lb, ton lot $1.31, less ton lot $1.33. Delivered. Spot, add 5c.

VANADIUM ALLOYS

Ferrovanadium: Open-hearth grade (V 50-55%, Si 8% max, C 3% max). Contract, any quantity, $3.20 per lb of contained V. Delivered. Spot, add 10c. **Special Grade:** (V 50-55% or 70-75%, Si 2% max., C 0.5% max) $3.30. **High Speed Grade:** (V 50-55%, or 70-75%, Si 1.50% max, C 0.20% max) $3.40.

Grainal: Vanadium Grainal No. 1 $1.05 per lb; No. 79, 50c, freight allowed.

Vanadium Oxide: Contract less carload lot, packed, $1.38 per lb contained V_2O_5, freight allowed. Spot, add 5c.

SILICON ALLOYS

50% Ferrosilicon: Contract, carload, lump, bulk, 14.20c per lb of contained Si. Packed c.l. 16.70c, ton lot 18.15c, less ton 19.80c, f.o.b. Alloy, W. Va.; Ashtabula, Marietta, O., Sheffield, Ala.; Portland, Oreg. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max). Add 1.45c to 50% ferrosilicon prices.

65% Ferrosilicon: Contract, carload, lump, bulk, 15.25c per lb contained silicon. Packed, c.l. 17.25c, ton lot 19.05c, less ton 20.4c. Delivered. Spot, add 0.35c.

75% Ferrosilicon: Contract, carload, lump, bulk, 16.4c per lb of contained Si. Packed, c.l. 18.30c, ton lot 19.95c, less ton 21.2c. Delivered. Spot, add 0.3c.

90% Ferrosilicon: Contract, carload, lump, bulk, 19.5c per lb of contained Si. Packed, c.l. 21.15c, ton lot 22.55c, less ton 23.6c. Delivered. Spot, add 0.25c.

Silicon Metal: (98% min Si, 1.00% max Fe, 0.07% max Ca). C.l. lump, bulk, 21.00c per lb of Si. Packed, c.l. 22.65c, ton lot 23.95c, less ton 24.95c. Add 0.5c for max 0.03% Ca grade. Add 0.5c for 0.50 Fe grade analyzing min 98.25% min Si.

Alsifer: (Approx 20% Al, 40% Si, 40% Fe). Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 9.60c per lb of alloy; ton lot, packed, 10.95c.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 39-43%, C 0.20% max). Contract, c.l. lump, bulk, 9.25c per lb of alloy. Packed, c.l. 10.45c, ton lot 11.6c, less ton 12.45c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max). Contract, carload, lump, packed 27.25c per lb of alloy, ton lot 28.4c, less ton 29.65c. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroboron: (B 17.50% min, Si 1.50% max, Al 0.50% max, C 0.50% max). Contract, 100 lb or more 1" x D, $1.20 per lb of alloy; less than 100 lb $1.30. Delivered. Spot, add 5c. F.o.b. Washington, Pa., prices, 100 lb and over are as follows: Grade A (10-14% B) 85c per lb; Grade B (14-18% B) $1.20; Grade C (19% min B) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si). Carload, bulk, lump, or 3" x D, $5.25 per lb of contained B. Packed, carload $5.40, ton to c.l. $5.50, less ton $5.60. Delivered.

Carbortam: (B 1 to 2%). Contract, lump, carload $320 per ton, f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Contract, carload, lump, bulk 23c per lb of alloy, carload packed 24.25c, ton lot 26.15c, less ton 27.15c. Delivered. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.5-3%). Contract, carload, lump, bulk 24c per lb of alloy, carload packed 25.65c, ton lot 27.95c, less ton 29.45c. Delivered. Spot, add 0.25c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx 3⅜ lb each and containing 2 lb of Cr). Contract, carload, bulk 19.60c per lb of briquet, carload packed in box pallets 19.80c, in bags 20.70c; 3000 lb to c.l. in box pallets 21.00c; 2000 lb to c.l. in bags 21.90c; less than 2000 lb in bags 22.80c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx 3 lb and containing 2 lb of Mn). Contract, carload, bulk 14.8c per lb of briquet; c.l., packed, pallets 15c, bags 16c; 3000 lb to c.l., pallets 16.2c; 2000 lb to c.l., bags 17.2c; less ton 18.1c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx 3½ lb and containing 2 lb of Mn and approx ½ lb of Si). Contract, c.l. bulk 15.1c per lb of briquet; c.l. packed, pallets 15.3c; bags 16.3c, 3000 lb to c.l., pallets 16.5c; 2000 lb to c.l., bags 17.5c; less ton 18.4c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx 5 lb and containing 2 lb of Si). Contract, carload, bulk 7.7c per lb of briquet; packed, pallets 7.9c; bags 8.9c; 3000 lb to c.l., pallets 9.5c; 2000 lb to c.l., bags 10.5c; less ton 11.4c. Delivered. Spot, add 0.25c. (Small size—weighing approx 2½ lb and containing 1 lb of Si). Carload, bulk 7.85c. Packed, pallets 8.05c; bags 9.05c; 3000 lb to c.l., pallets 9.65c; 2000 lb to c.l., bags 10.65c; less ton 11.55c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each). $1.41 per lb of Mo contained, f.o.b. Langeloth, Pa.

TUNGSTEN ALLOYS

Ferrotungsten: (70-80%). 5000 lb W or more $2.15 per lb (nominal) of contained W. Delivered.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 50-60%, Si 8% max, C 0.4% max). Ton lots 2" x D, $4 per lb of contained Cb; less ton lots $4.05 (nominal). Delivered.

Ferrotantalum Columbium: (Cb 40% approx, Ta 20% approx, and Cb plus Ta 60% min, C 0.30% max). Ton lots 2" x D, $3.80 per lb of contained Cb plus Ta, delivered; less ton lots $3.85 (nominal).

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx). Contract, c.l. packed ½-in. x 12 M 20.00c per lb of alloy, ton lot 21.15c, less ton 22.40c. Delivered. Spot, add 0.25c.

Graphidox No. 4: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 20c per lb of alloy, ton lot 21.15c; less ton lot 22.4c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed 18.45c per lb of alloy; ton lot 19.95c; less ton lot 21.20c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

Simanal: (Approx 20% each Si, Mn, Al; bal Fe) Lump, carload, bulk 19.25c. Packed c.l. 20.25c, 2000 lb to c.l. 21.25c; less than 2000 lb 21.75c per lb of alloy. Delivered.

Ferrophosphorus: (23-25% based on 24% P content with unitage of $5 for each 1% of P above or below the base). Carload, bulk, f.o.b. sellers' works. Mt. Pleasant, Siglo, Tenn., $120 per gross ton.

Ferromolybdenum: (55-75%). Per lb of contained Mo, in 200-lb container, f.o.b. Langeloth and Washington, Pa. $1.68 in all sizes except powdered which is $1.74.

Technical Molybdic-Oxide: Per lb of contained Mo, in cans, $1.39; in bags, $1.38, f.o.b. Langeloth and Washington, Pa.

Think carefully: Have you seen this man anywhere around your plant?

His name is WILLIS JOSEPH HAMILTON, and he's

WANTED FOR MURDER

WILLIS JOSEPH HAMILTON is being sought by the FBI for unlawful flight to avoid prosecution for the crime of murder. Hamilton has been employed in foundries and by manufacturers of steel products, and may seek employment or already be employed in such industries.

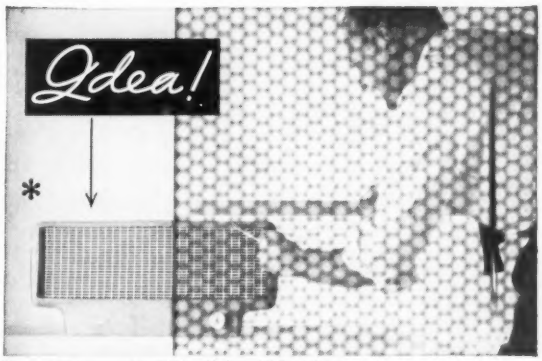
On June 26, 1953, Hamilton is alleged to have shot and killed one William H. Goolsby in a Cleveland, Ohio, restaurant following an argument over the payment of a check. A complaint was filed before a U.S. Commissioner at Cleveland, Ohio, June 29, 1953, charging Hamilton with a violation of Title 18, U.S. Code, Section 1073, in that he fled from the State of Ohio to avoid prosecution for the crime of murder.

Hamilton uses several aliases: Joe Brown, Thomas Collins, Jimmie Dale, Willie Foster, William Hamilton, Willie Hamilton, John Tabot, Joe Talbert, John Talbert, Joseph J. White, James Williams, John Williams, Joseph Whyte, Joe Whyth.

This fugitive has escaped from confinement on numerous occasions. He reportedly carries a .45 caliber automatic under his left shoulder in a shoulder holster. He reportedly practices drawing this automatic while pretending to reach for cigarets. He reportedly has another automatic pistol in his possession. Accordingly, he should be considered armed and dangerous. Hamilton has been convicted for robbery, highway robbery, armed robbery, and breaking and entering to commit a misdemeanor. Fugitive was born April 16, 1902, St. Augustine, Florida; height, 5'7"; weight, 160 lbs.; build, medium; hair, black graying, kinky; eyes, brown; complexion, medium brown; race, Negro; nationality, American. Occupations, laborer, steel foundry worker, chauffeur. Scars and marks: small cut scar running into and above right eye; small cut scar above left eye; cut scar right edge of nose; 1" scar left side of face near ear. Has several gold-capped teeth, large vaccination outside upper left arm, large cut scar on back of right hand near base of index finger. Hamilton is said to drink to excess and has an ungovernable temper. He is an accomplished trumpet player and occasionally wears a mustache.

Any person having information which might assist in locating this fugitive is requested to immediately notify the Director of the Federal Bureau of Investigation, United States Department of Justice, Washington 25, D. C., or the SPECIAL AGENT IN CHARGE OF THE NEAREST FBI DIVISION. . . . the telephone number is on the first page of your local telephone directory.

This space contributed by STEEL as a public service.



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Scrap Holds in Inactive Market

STEEL's composite on the prime grade is unchanged at $43, but the trend is uncertain. Prospects for automotive labor peace provide an encouraging note for fourth quarter

Scrap Prices, Page 138

Pittsburgh—Little scrap is being traded, but prices remain firm. Most brokers expect the market to spurt once Chrysler and General Motors nail down their contracts with the United Auto Workers. It's thought the automakers will release larger steel orders when their strike fears have been allayed. Brokers were unable to make a profit on a recent mill order for No. 1 heavy melting scrap at $45 a ton. Dealers are holding out for higher prices.

Chicago—The market is not reacting to the auto labor agreement. Bullish and bearish influences are neutralizing each other. A fourth quarter rise in the steelmaking rate is assured with the passing of the strike threat, and expanded steelmaking means higher scrap consumption is in prospect. Mounting output of 1959 model autos indicates heavy generation of scrap, and with the mills buying sparingly, a scrap surplus is likely to depress prices. Observers feel that October isn't going to be an active month, and that this weakness will unsettle the market. Some strengthening is anticipated later in the year.

Philadelphia — The tone of the scrap market is firmer with low phos structurals and plate higher at $44-$45, delivered, and rail crops (2 ft and under), $58-$60. Malleable is also higher at $59-$60, delivered, and drop-broken machinery at $49-$50.

New York—Brokers' buying prices are firm, with low phos structurals and plate higher at $37-$38. With a general increase in stainless steel scrap of $5 a ton, 18-8 sheets, clips, and solids are quoted $180-$185, 18-8 borings and turnings $80-$85, 410 sheets, clips and solids $55-$60, and 430 grades $75-$80.

In the major tonnage grades, more manufacturers scrap is being generated. Strength is maintained by stronger demand, including further buying of open hearth scrap by European consumers. Foreign orders have been placed for delivery well into November, and, in general, brokers anticipate a good movement abroad during the fourth quarter.

Cleveland—Scrap traders anticipate a heavy increase in automotive lists at the end of the month. What effect it will have on prices is uncertain, but some dealers think it will result in lower bids. The market is inactive, but prices are unchanged and nominal in the absence of a buying test. The bringing in of additional blast furnace capacity is tending to offset market strength normally attending rising steelmaking operations.

Detroit—The market is in a tur-

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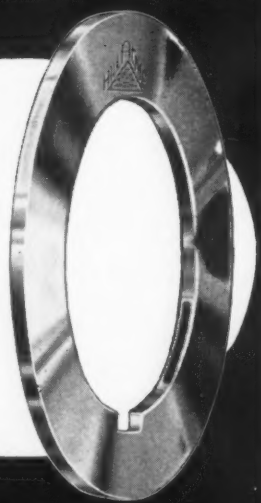

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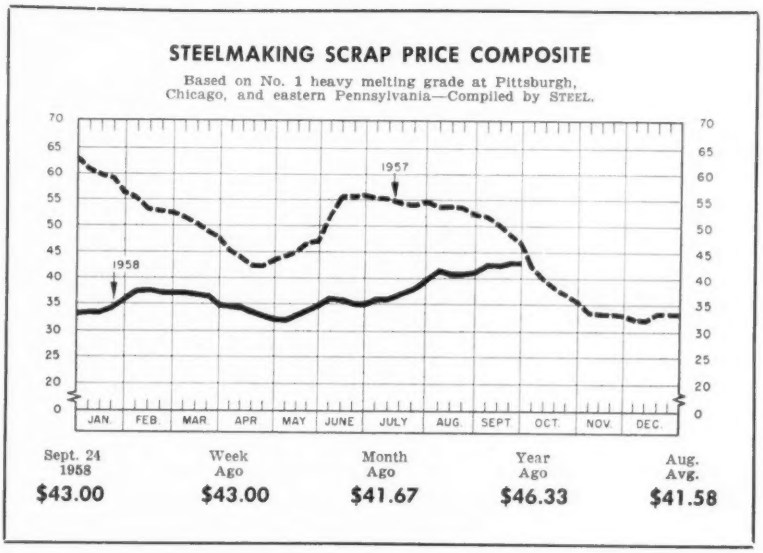

STEELMAKING SCRAP PRICE COMPOSITE
Based on No. 1 heavy melting grade at Pittsburgh, Chicago, and eastern Pennsylvania—Compiled by STEEL.
1957
1958
JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC.
Sept. 24 1958 $43.00
Week Ago $43.00
Month Ago $41.67
Year Ago $46.33
Aug. Avg. $41.58

moil as dealers and brokers wait for auto list closings. The Ford-UAW contract has stirred up the trade, but until the lists are acted upon nobody seems sure which way prices will go.

Buffalo—The cast iron grades are moving ahead here, but the steel mill grades are marking time. Cupola cast is up $2 a ton to $44, reflecting sales to district foundries. Supplies of cast are limited.

Cincinnati—There's little activity in the market, but brokers and dealers anticipate a $1 increase on the principal steelmaking grades. Last week, No. 1 cupola cast was quoted up $1 at $43-$44.

St. Louis—The market is dull, but prices appear firm. Mills have adequate inventories, but they are taking virtually everything offered them at current price levels. Dealers are not offering much tonnage.

Birmingham—Most scrap dealers here are anticipating a price increase and are not accepting new orders. Some distress scrap, particularly cast grades, is moving, but orders are limited.

Houston—Scrap dealers are piling material in their yards in anticipation of an October price increase. Shipments on an expiring September mill order have been slow, and indications are that mill buying prices will be raised $1 to $2 a ton.

Shipments to Mexico have been curtailed by a tightening of rail car permits.

Seattle—Mill buyers are practically out of the scrap market. Inventories are sizable, and sales are few. Prices are unchanged, and they are nominal in the absence of a buying test.

The export market is depressed. Japan took only six full cargoes of scrap last quarter, running 40 per cent No. 1 heavy melting, 40 per cent No. 2 heavy melting, and 20 per cent bundles.

San Francisco — The cast iron grades are firm. Prices on the steel grades have held unchanged for several months, and no early revision is sighted despite reported weakness in some areas of the market.

Los Angeles—Mill inventories remain high, and there is little indication that buying will come to life soon. Offshore activity is at a standstill. With material piling up in yards, collections are down.

Semifinished Steel . . .

Semifinished Prices, Page 125

The national ingot rate held unchanged last week at 66.5 per cent of capacity. But indications are the uptrend in operations will be resumed soon, with output averaging around 75 per cent in the fourth quarter.

The Chicago steelmaking rate (76.5 per cent) is about 10 points ahead of the national pace. Backlogs of district mills are increasing steadily; books are fuller than they have been at any time this year. For one mill, the gain the last month has been about 12 per cent.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 133

A sample shipment of coal from the Bering River field near Cordova, Alaska, has been made to Japan for tests on coking properties. Japanese industrialists recently visited the deposits.

Virginia mines have been supplying Japan with coking coal. Jewel River Coal Corp., Tazewell, Va., and the Japanese steelmakers are in a joint development of the Alaskan field—estimated at 900 million tons.

Structural Shapes . . .

Structural Shape Prices, Page 125

Despite moderately brisk demand, structural fabricators are competing sharply for new tonnage. Fabricated prices are probably lower than they were before the increases on plain structural material in July and August.

Public work continues to feature demand. Bridge tonnage accounts for 80 per cent of new estimating in New England. Only educational buildings maintain the inquiry level in general construction in that area. Although initial contracts for the Prudential Life Insurance Center, Boston, involving 40,000 tons, are being placed, some commercial and industrial projects have been deferred.

Some decline in wide flange beam and built-up plate girder inquiry is reported.

While some larger fabricators have backlogs of four to five months, others are in a less favorable position, and certain small shops are having difficulty maintaining backlogs of any kind. Overall, average backlogs have been fairly well sustained over the last few weeks.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

15,000 tons, 41-story office building, First National City Bank of New York, 399 Park Ave., New York, through George A. Fuller Co., general contractor, to American Bridge Div., U. S. Steel Corp., Pittsburgh.

1420 tons, Employment Security Building, Baltimore, through Blake Construction Co., general contractor, to Schacht Steel Construction Inc., New York.

585 tons, state bridgework, Lackawanna County, Pennsylvania, to High Welding Co., Lancaster, Pa.

475 tons, junior high school, Bucks County, Pennsylvania, to Grays Metal Works Inc., Philadelphia.

(*Please turn to Page* 144)

Iron and Steel Scrap

(Consumer prices per gross ton, except as otherwise noted, including brokers' commission, as reported to STEEL, Sept. 24, 1958. *Changes shown in italics.*

STEELMAKING SCRAP COMPOSITE

Sept. 24	$43.00
Sept. 17	43.00
Aug. Avg.	41.58
Sept. 1957	47.73
Sept. 1953	36.95

and eastern Pennsylvania.
Based on No. 1 heavy melting grade at Pittsburgh, Chicago,

PITTSBURGH

No. 1 heavy melting	43.00-44.00
No. 2 heavy melting	*33.00-34.00*
No. 1 dealer bundles	43.00-44.00
No. 2 bundles	31.00-32.00
No. 1 busheling	43.00-44.00
No. 1 factory bundles	47.00-48.00
Machine shop turnings	20.00-21.00
Mixed borings, turnings	20.00-21.00
Short shovel turnings	24.00-25.00
Cast iron borings	24.00-25.00
Cut structurals:	
2 ft and under	49.00-50.00
3 ft lengths	48.00-49.00
Heavy turnings	41.00-42.00
Punchings & plate scrap	49.00-50.00
Electric furnace bundles	49.00-50.00

Cast Iron Grades

No. 1 cupola	43.00-44.00
Stove plate	41.00-42.00
Unstripped motor blocks	23.00-24.00
Clean auto cast	39.00-40.00
Drop broken machinery	51.00-52.00

Railroad Scrap

No. 1 R.R. heavy melt.	48.00-49.00
Rails, 2 ft and under	57.00-58.00
Rails, 18 in. and under	58.00-59.00
Random rails	54.00-55.00
Railroad specialties	52.00-53.00
Angles, splice bars	52.00-53.00
Rails, rerolling	60.00-61.00

Stainless Steel Scrap

18-8 bundles & solids	*225.00-230.00*
18-8 turnings	115.00-120.00
430 bundles & solids	120.00-125.00
430 turnings	50.00-52.00

CHICAGO

No. 1 hvy melt, indus.	46.00-47.00
No. 1 hvy melt, dealer	44.00-45.00
No. 2 heavy melting	37.00-38.00
No. 1 factory bundles	*48.00-49.00*
No. 1 dealer bundles	*42.00-43.00*
No. 2 bundles	31.00-32.00
No. 1 busheling, indus.	46.00-47.00
No. 1 busheling, dealer	44.00-45.00
Machine shop turnings	22.00-23.00
Mixed borings, turnings	24.00-25.00
Short shovel turnings	24.00-25.00
Cast iron borings	24.00-25.00
Cut structurals, 3 ft	49.00-50.00
Punchings & plate scrap	50.00-51.00

Cast Iron Grades

No. 1 cupola	46.00-47.00
Stove plate	44.00-45.00
Unstripped motor blocks	39.00-40.00
Clean auto cast	52.00-53.00
Drop broken machinery	52.00-53.00

Railroad Scrap

No. 1 R.R. heavy melt.	*48.00-49.00*
R.R. malleable	57.00-58.00
Rails, 2 ft and under	60.00-61.00
Rails, 18 in. and under	61.00-62.00
Angles, splice bars	56.00-57.00
Axles	70.00-71.00
Rails, rerolling	65.00-66.00

Stainless Steel Scrap

18-8 bundles & solids	215.00-220.00
18-8 turnings	115.00-120.00
430 bundles & solids	115.00-120.00
430 turnings	65.00-70.00

YOUNGSTOWN

No. 1 heavy melting	43.00-44.00
No. 2 heavy melting	30.00-31.00
No. 1 busheling	43.00-44.00
No. 1 bundles	43.00-44.00
No. 2 bundles	30.00-31.00
Machine shop turnings	15.00-16.00
Short shovel turnings	20.00-21.00
Cast iron borings	20.00-21.00
Low phos.	45.00-46.00
Electric furnace bundles	45.00-46.00

Railroad Scrap

No. 1 R.R. heavy melt.	47.00-48.00

CLEVELAND

No. 1 heavy melting	39.50-40.50
No. 2 heavy melting	26.00-27.00
No. 1 factory bundles	44.00-45.00
No. 1 bundles	39.50-40.50
No. 2 bundles	28.00-29.00
No. 1 busheling	39.50-40.50
Machine shop turnings	14.00-15.00
Short shovel turnings	20.00-21.00
Mixed borings, turnings	20.00-21.00
Cast iron borings	20.00-21.00
Cut foundry steel	41.00-42.00
Cut structurals, plates 2 ft and under	46.00-47.00
Low phos. punchings & plate	41.00-42.00
Alloy free, short shovel turnings	22.00-23.00
Electric furnace bundles	40.50-41.50

Cast Iron Grades

No. 1 cupola	44.00-45.00
Charging box cast	37.00-38.00
Heavy breakable cast.	36.00-37.00
Stove plate	43.00-44.00
Unstripped motor blocks	32.00-33.00
Brake shoes	36.00-37.00
Clean auto cast	49.00-50.00
Burnt cast	33.00-34.00
Drop broken machinery	49.00-50.00

Railroad Scrap

R.R. malleable	60.00-61.00
Rails, 2 ft and under	57.00-58.00
Rails, 18 in. and under	58.00-59.00
Rails, random lengths	52.00-53.00
Cast steel	49.00-50.00
Railroad specialties	50.00-51.00
Uncut tires	43.00-44.00
Angles, splice bars	50.00-51.00
Rails, rerolling	56.00-57.00

Stainless Steel

(Brokers' buying prices; f.o.b. shipping point)

18-8 bundles, solids	185.00-190.00
18-8 turnings	100.00-105.00
430 clips, bundles, solids	90.00-100.00
430 turnings	40.00-50.00

ST. LOUIS

(Brokers' buying prices)

No. 1 heavy melting	**38.00**
No. 2 heavy melting	**36.00**
No. 1 bundles	**40.00**
No. 2 bundles	**29.00**
No. 1 busheling	**40.00**
Machine shop turnings	**20.00†**
Short shovel turnings	**22.00†**

Cast Iron Grades

No. 1 cupola	**47.00**
Charging box cast	**39.00**
Heavy breakable cast.	**38.00**
Unstripped motor blocks	**39.00**
Clean auto cast	*49.00*
Stove plate	*46.00*

Railroad Scrap

No. 1 R.R. heavy melt.	*45.50*
Rails, 18 in. and under	52.00†
Rails, random lengths	47.50
Rails, rerolling	*63.25*
Angles, splice bars	**47.00**

BIRMINGHAM

No. 1 heavy melting	35.00-36.00*
No. 2 heavy melting	30.00-31.00*
No. 1 bundles	35.00-36.00*
No. 2 bundles	23.00-24.00
No. 1 busheling	35.00-36.00*
Cast iron borings	12.00-13.00
Machine shop turnings	24.00-25.00
Short shovel turnings	25.00-26.00
Bars, crops and plates	45.00-46.00
Structurals & plates	44.00-45.00
Electric furnace bundles	39.00-40.00
Electric furnace:	
2 ft and under	38.00-39.00
3 ft and under	37.00-38.00

Cast Iron Grades

No. 1 cupola	53.00-54.00
Stove plate	53.00-54.00
Unstripped motor blocks	42.00-43.00
Charging box cast	*23.00-24.00*
No. 1 wheels	*40.00-41.00*

Railroad Scrap

No. 1 R.R. heavy melt.	39.00-40.00
Rails, 18 in. and under	51.00-52.00
Rails, rerolling	59.00-60.00
Rails, random lengths	47.00-48.00
Angles, splice bars	47.00-48.00

PHILADELPHIA

No. 1 heavy melting	40.00
No. 2 heavy melting	36.00
No. 1 bundles	40.00
No. 2 bundles	25.00
No. 1 busheling	40.00
Electric furnace bundles	41.00
Mixed borings, turnings	20.00-21.00†
Short shovel turnings	23.00-24.00
Machine shop turnings	20.00-21.00
Heavy turnings	34.00
Structurals & plate	*44.00-45.00*
Couplers, springs, wheels	45.50†
Rail crops, 2 ft & under	*58.00-60.00*

Cast Iron Grades

No. 1 cupola	40.00
Heavy breakable cast.	44.00
Malleable	*59.00-60.00*
Drop broken machinery	*49.00-50.00*

NEW YORK

(Brokers' buying prices)

No. 1 heavy melting	33.00-34.00
No. 2 heavy melting	30.00-31.00
No. 1 bundles	33.00-34.00
No. 2 bundles	19.00-20.00
Machine shop turnings	10.00-11.00
Mixed borings, turnings	11.00-12.00
Short shovel turnings	14.00-15.00
Low phos. (structurals & plates)	*37.00-38.00*

Cast Iron Grades

No. 1 cupola	35.00-36.00
Unstripped motor blocks	28.00-29.00
Heavy breakable	33.00-34.00

Stainless Steel

18-8 sheets, clips, solids	*180.000-185.00*
18-8 borings, turnings	*80.00-85.00*
410 sheets, clips, solids	*55.00-60.00*
430 sheets, clips, solids	*75.00-80.00*

BUFFALO

No. 1 heavy melting	34.00-35.00
No. 2 heavy melting	29.00-30.00
No. 1 bundles	34.00-35.00
No. 2 bundles	27.00-28.00
No. 1 busheling	34.00-35.00
Mixed borings, turnings	17.00-18.00
Machine shop turnings	15.00-16.00
Short shovel turnings	19.00-20.00
Cast iron borings	17.00-18.00
Low phos. structurals and plate, 2 ft and under	43.00-44.00

Cast Iron Grades
(F.o.b. shipping point)

No. 1 cupola	*43.00-44.00*
No. 1 machinery	*47.00-48.00*

Railroad Scrap

Rails, random lengths	53.00-54.00
Rails, 3 ft and under	59.00-60.00
Railroad specialties	43.00-44.00

CINCINNATI

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	38.50-39.50
No. 2 heavy melting	32.50-33.50
No. 1 bundles	38.50-39.50
No. 2 bundles	25.00-26.00
No. 1 busheling	38.50-39.50
Machine shop turnings	18.00-19.00
Mixed borings, turnings	17.00-18.00
Short shovel turnings	20.00-21.00
Cast iron borings	17.00-18.00
Low phos. 18 in.	*45.00-46.00*

Cast Iron Grades

No. 1 cupola	*43.00-44.00*
Heavy breakable cast.	34.00-35.00
Charging box cast	34.00-35.00
Drop broken machinery	*47.00-48.00*

Railroad Scrap

No. 1 R.R. heavy melt.	44.00-45.00
Rails, 18 in. and under	55.00-56.00
Rails, random lengths	*48.00-49.00*

HOUSTON

(Brokers' buying prices; f.o.b. cars)

No. 1 heavy melting	38.00
No. 2 heavy melting	33.00
No. 2 bundles	24.00
Machine shop turnings	17.00
Short shovel turnings	20.00
Low phos. plates & structurals	*44.00*

Cast Iron Grades

No. 1 cupola	*46.00*
Heavy breakable	30.00†
Foundry malleable	*41.00*
Unstripped motor blocks	37.00

Railroad Scrap

No. 1 R.R. heavy melt.	38.00

BOSTON

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*29.00*
No. 2 heavy melting	22.50
No. 1 bundles	*29.00*
No. 2 bundles	21.00
No. 1 busheling	*29.00*
Machine shop turnings	8.00-9.00
Short shovel turnings	10.00-11.00
No. 1 cast	33.00-34.00
Mixed cupola cast	33.00-34.00
No. 1 machinery cast	36.00-38.00

DETROIT

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	32.00-33.00
No. 2 heavy melting	21.00-22.00
No. 1 bundles	33.00-34.00
No. 2 bundles	20.00-21.00
No. 1 busheling	31.00-32.00
Machine shop turnings	9.00-10.00
Mixed borings, turnings	10.00-11.00
Short shovel turnings	11.00-12.00
Punchings & plate	32.00-33.00

Cast Iron Grades

No. 1 cupola	36.00-37.00
Stove plate	27.00-28.00
Charging box cast	27.00-28.00
Heavy breakable	26.00-27.00
Unstripped motor blocks	16.00-17.00
Clean auto cast	37.00-38.00

SEATTLE

No. 1 heavy melting	30.00†
No. 2 heavy melting	28.00†
No. 1 bundles	22.00†
No. 2 bundles	20.00†
Machine shop turnings	9.00-10.00†
Mixed borings, turnings	9.00-10.00†
Electric furnace No. 1	38.00†

Cast Iron Grades

No. 1 cupola	31.00†
Heavy breakable cast.	28.00†
Unstripped motor blocks	23.00†
Stove plate (f.o.b. plant)	21.00†

LOS ANGELES

No. 1 heavy melting	32.00
No. 2 heavy melting	30.00
No. 1 bundles	28.00
No. 2 bundles	17.00
Machine shop turnings	11.00
Shoveling turnings	13.00
Cast iron borings	13.00
Cut structurals and plate 1 ft and under	45.00

Cast Iron Grades
(F.o.b. shipping point)

No. 1 cupola	39.00

Railroad Scrap

No. 1 R.R. heavy melt.	32.00

SAN FRANCISCO

No. 1 heavy melting	32.00
No. 2 heavy melting	30.00
No. 1 bundles	30.00
No. 2 bundles	22.00
Machine shop turnings	15.00
Mixed borings, turnings	15.00
Cast iron borings	15.00
Heavy turnings	15.00
Short shovel turnings	15.00
Cut structurals, 3 ft	40.00

Cast Iron Grades

No. 1 cupola	*44.00*
Charging box cast	34.00
Stove plate	34.00
Heavy breakable cast.	28.00
Unstripped motor blocks	31.00
Clean auto cast	40.00
Drop broken machinery	40.00
No. 1 wheels	34.00

HAMILTON, ONT.

No. 1 heavy melting	30.00
No. 2 heavy melting	26.00
No. 1 bundles	30.00
No. 2 bundles	23.00
Mixed steel scrap	25.00
Mixed borings, turnings	15.00
Busheling, new factory:	
Prepared	30.00
Unprepared	24.00
Short steel turnings	19.00

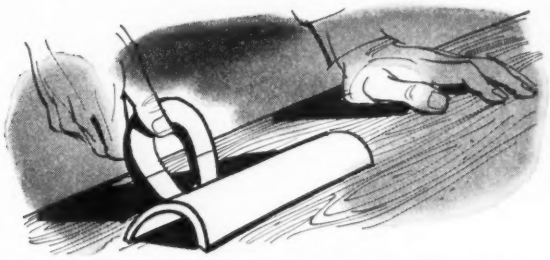
Cast Iron Grades‡

No. 1 machinery cast	45.00-50.00

*Brokers' buying price.
†Nominal.
‡F.o.b. Hamilton, Ont.

S-E-G-R-E-G-A-T-E-D SCRAP IS WORTH MORE

Rub specimen with emery paper to obtain clean surface. Add 1 drop of 1:1 Nitric Acid. If there is no attack the material is STAINLESS STEEL.



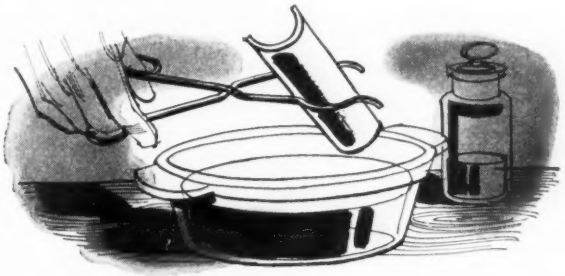
Test sample with magnet. Non-magnetic results indicate that sample is one of the 18-8 stainless steels.

Here is how to test for

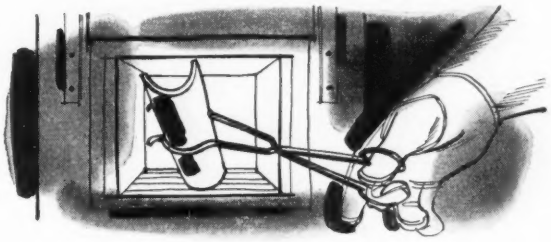
STAINLESS STEEL TYPES 302 and 304

Last year, these two basic 18-8 stainless steel types accounted for the largest percentage of all the stainless steel produced. A recent survey among fabricators indicates that 68 percent expect to use more stainless steel in the future. To satisfy this expanding market for special steels, today's producers and fabricators require more and more scrap of known analysis.

Our personnel, equipment, experience and strategically located facilities are geared to the purchase or sale of dependably segregated metals. We welcome your inquiry.



Place specimen in a solution of Muriatic Acid (1 part water, 1 part Muriatic Acid) at a temperature of 180/190 degrees F. After 5 minutes TYPES 302, 304, 305, 316, 317, 321 and 347. will be white, while 303 will have black smudge. Then, place specimen in fresh solution of Muriatic Acid at temperature of 180/190 degrees F. Within 2 minutes there will be active attack and gas evolution on Types 302, 304, 321 and 347.



To separate Types 302 and 304 from 321 and 347, a stabilization test is necessary. Heat specimens to 1250 degrees F for 2 hours and then cool to room temperature in air. Then place specimens in cold solution of 3 parts Nitric Acid, 1 part Hydrofluoric Acid and 6 parts water. Leave for 1 hour. Remove specimens from solution and wash with water. STAINLESS TYPES 302 and 304 will have a rough granular surface.

Luria Brothers and Company, Inc.

MAIN OFFICE • PHILADELPHIA NATIONAL BANK BUILDING, PHILADELPHIA 7, PENNSYLVANIA.

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IMPORT & EXPORT—LIVINGSTON & SOUTHARD, INC., 99 Park Ave., New York, N.Y. • Cable Address: FORENTRACO

Lead, Zinc Imports Cut

Administration establishes quota plan to limit amount of ores, concentrates, and metal that can be imported. Tariffs ruled out. Copper market continues to strengthen

Nonferrous Metal Prices, Pages 142 & 143

SPECULATION on what type relief the administration would grant the domestic lead and zinc industry ended Sept. 22: The President announced he was imposing quotas on imports of the two metals.

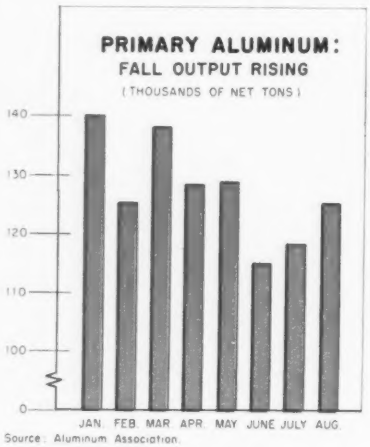
Specifics—Beginning Oct. 1, the plan calls for imports of ores, concentrates, and metal to be limited to 80 per cent of the average annual commercial imports for 1953-57. It works out to a yearly quota of 354,720 tons for lead and 520,800 tons for zinc. Last year, 522,194 tons of lead and 794,764 tons of zinc were brought into the U. S., reports the American Bureau of Metal Statistics. During the first six months this year, zinc imports hit 348,824 tons, a little under the year-ago figure, but lead imports were up sharply to 318,689 tons.

Quarterly quotas based on the 80 per cent formula have been established for exporting countries. But it appears that no limit will be set on what a producer can ship as long as his country's total exports don't exceed the quarterly quota.

Full details of the plan haven't been spelled out—such as which governmental body will have control over the program and how long it will run.

Reaction—Opinions on the benefits of a quota system vary. Companies without foreign holdings say they would have preferred higher tariffs but that quotas are preferable to the now defunct Seaton stockpile bill. Some complain the quota setup will still leave foreign producers too big a share of the domestic market. (Republican members of the Tariff Commission recommended back in April that imports be limited to 50 per cent of the 1953-1957 average.) Before the President's announcement, American Smelting & Refining Co. had gone on record as opposing quotas but adding that "a scheme of quota restrictions on imports of refined lead and zinc is administratively feasible." Asarco went on to say: Because domestic lead and zinc smelters obtain half their raw materials abroad, quotas on ores and concentrates could cause a reduction in employment.

What To Expect—Quotas will have a bullish effect on the U. S. market, a bearish effect overseas. Look for: 1. Domestic lead and zinc prices to rise, perhaps not right away but certainly before the end of the year. 2. Production cutbacks by foreign producers. 3. A gradual reduction in stocks of domestic producers and a rise in stocks in other countries.



Source: Aluminum Association

The Problem—Even with quotas, domestic production and imports will continue to be greater than U. S. consumption for some time, especially in lead. But demand is on the upswing. September could be the best month of the year for both metals.

Copper Market Strong

The copper picture continues to brighten. Not only is domestic business improving, but the strikes at African and Canadian mines have further firmed the world price. Kantanga was up to 27.25 cents a pound last week, the London Metal Exchange to over 26.50.

The stage is set for price hikes in the U. S. Don't look for primary producers to go up right away, but expect a bump on quotations before yearend if the world market continues to improve. Some metalmen expect an early jump in the custom smelter price now that International Nickel Co.'s Canadian copper mines are on strike.

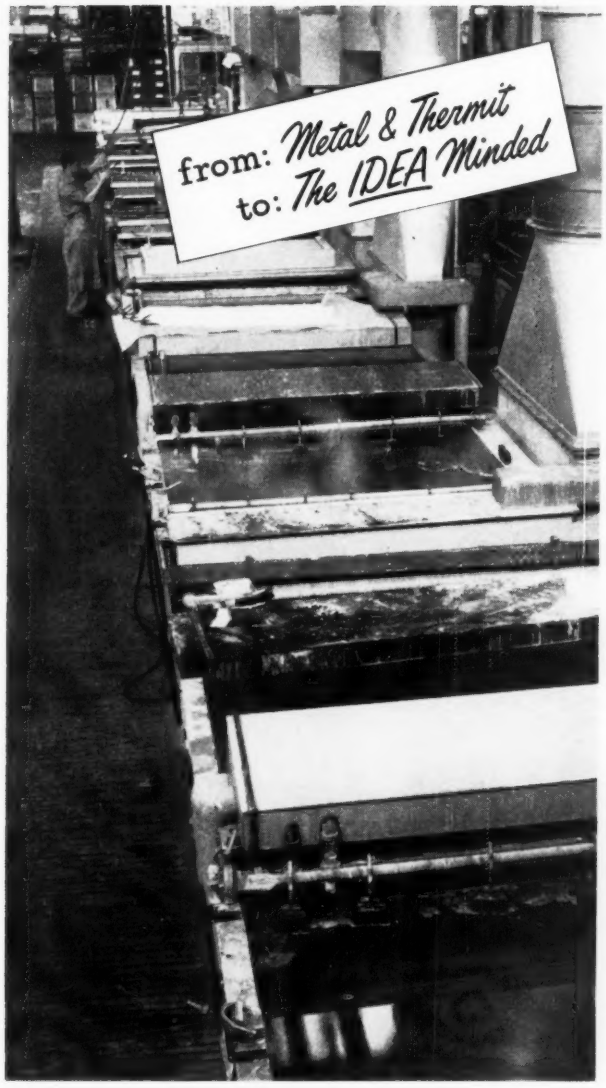
Market Memos

- Platinum prices took their fourth dive of the year on Sept. 22 and now stand at $57 to $60 a troy ounce. Competition from foreign metal and less domestic demand are responsible for dropping the metal's price to a ten-year low, say domestic refiners.
- Aluminum Co. of America says it has produced a lightweight aluminum-fin automobile radiator that can be manufactured today at raw material costs averaging 20 per cent less than conventional copper-brass units.

NONFERROUS PRICE RECORD

	Sept. 24 Price	Last Change	Previous Price	Aug. Avg	July Avg	Sept., 1957 Avg
Aluminum	24.70	Aug. 1, 1958	24.00	24.700	24.000	26.000
Copper	26.50	Sept. 17, 1958	26.375-26.50	26.510	26.125	26.469
Lead	10.80	Sept. 17, 1958	10.55	10.646	10.800	13.800
Magnesium	35.25	Aug. 13, 1956	33.75	35.250	35.250	35.250
Nickel	74.00	Dec. 6, 1956	64.50	74.000	74.000	74.000
Tin	92.75	Sept. 24, 1958	93.375	94.995	94.950	93.422
Zinc	10.00	July 1, 1957	10.50	10.000	10.000	10.000

Quotations in cents per pound based on: COPPER, mean of primary and secondary, deld. Conn. Valley; LEAD, common grade, deld. St. Louis; ZINC, prime western, E. St. Louis; TIN, Straits, deld. New York; NICKEL, electrolytic cathodes, 99.9%, base size at refinery, unpacked; ALUMINUM, primary pig, 99.5+%, f.o.b. shipping point; MAGNESIUM, pig, 99.8%, Velasco, Tex.



"Lifetime" protection for inaccessible tank surfaces

Shown here are a few of the more than *1000* metal finishing tanks in a well known aircraft plant that have been coated inside and out with vinyl Unichrome "Super 5300" Plastisol.

Their exteriors are coated to protect against spillage of corrosive acid and alkaline cleaning and plating solutions, especially on areas inaccessible to maintenance when the tanks are installed close together. Thus, corrosion from the outside is blocked just as effectively as the lining stops it from the inside.

Applying "Super 5300" Coating costs less than most sheet linings. Sprayed on, it conforms without seams, pores or air pockets to irregular surfaces. Send for Bulletin SP-1.

Hurricane-proof building has ALL-welded construction

The 20-story First National Bank of Miami will have its steel skeleton completely welded . . . sub-assemblies as well as field connections.

In shop fabrication and erection, the welding cuts construction time, decreases costs, fully satisfies engineering strength requirements for this hurricane area. Allied Structural Steel Company, the shop fabricator, relies on M&T's Murex electrodes for strong, dependable welds coupled with speed and economy.

Send for Bulletin ESC on the M&T line of electrodes for all welding needs.

Better chromium for the new models

Already used by one car manufacturer, a new chromium plating process promises to put an end to pitted and rusted auto brightwork. Till now, *all* decorative chromium plate contained unavoidable pores and minute cracks that permitted corrosives to attack base metal (bottom). But new Unichrome Bright Crack-Free Chromium plates without cracking, and eliminates pores by permitting up to 10 times the thickness of ordinary decorative chrome plate. Result: trim that *stays* like new (top).

METAL & THERMIT
CORPORATION
GENERAL OFFICES: RAHWAY, NEW JERSEY
Pittsburgh • Atlanta • Detroit • E. Chicago • Los Angeles
In Canada: Metal & Thermit – United Chromium of Canada, Limited, Rexdale, Ont.

Nonferrous Metals

Cents per pound, carlots except as otherwise noted.

PRIMARY METALS AND ALLOYS

Aluminum: 99.5%, pigs 24.70; ingots, 26.80, 30,000 lb or more, f.o.b. shipping point. Freight allowed on 500 lb or more.

Aluminum Alloy: No. 13, 28.60; No. 43, 28.40; No. 195, 29.40; No. 214, 30.20; No. 356, 28.60; 30 or 40 lb ingots.

Antimony: R.M.M. brand, 99.5%, 29.00; Lone Star brand, 29.50, f.o.b. Laredo, Tex., in bulk. Foreign brands, 99.5%, 23.50-24.50, New York, duty paid, 10,000 lb or more.

Beryllium: 97% lump or beads, $71.50 per lb, f.o.b. Cleveland or Reading, Pa.

Beryllium Aluminum: 5% Be, $74.75 per lb of contained Be, with balance as Al at market price, f.o.b. shipping point.

Beryllium Copper: 3.75-4.25% Be, $43 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. shipping point.

Bismuth: $2.25 per ton, ton lots.

Cadmium: Sticks and bars, $1.55 per lb deld.

Cobalt: 97.99%, $2.00 per lb for 550-lb keg; $2.02 per lb for 100 lb case; $2.07 per lb under 100 lb.

Columbium: Powder, $55-85 per lb, nom.

Copper: Electrolytic, 26.50 deld.; custom smelters, 26.50; lake, 26.50 deld.; fire refined, 26.25 deld.

Germanium: First reduction, $179.17-197.31 per lb; intrinsic grade, $197.31-220 per lb, depending on quantity.

Gold: U. S. Treasury, $35 per oz.

Indium: 99.9%, $2.25 per troy oz.

Iridium: $70-80 nom. per troy oz.

Lead: Common, 10.80; chemical, 10.90; corroding, 10.90, St. Louis. New York basis, add 0.20.

Lithium: 98 + %, 50-100 lb, cups or ingots, $12; rod, $15; shot or wire, $16. 100-500 lb, cups or ingots, $10.50; rod, $14; shot or wire, $15, f.o.b. Minneapolis.

Magnesium: Pig, 35.25; ingot, 36.00 f.o.b. Velasco, Tex.; 12 in. sticks, 59.00 f.o.b. Madison, Ill.

Magnesium Alloys: AZ91A (diecasting), 40.75 deld.; AZ63A, AZ92A, AZ91C (sand casting), 40.75, f.o.b. Velasco, Tex.

Mercury: Open market, spot, New York, $240-242 per 76-lb flask.

Molybdenum: Unalloyed turned extrusions, 3.75-5.75 in. round, $9.60 per lb in lots of 2500 lb or more, f.o.b. Detroit.

Nickel: Electrolytic cathodes, sheets (4 x 4 in. and larger), unpacked, 74.00; 10-lb pigs, unpacked, 78.25; "XX" nickel shot, 79.50; "F" nickel shot for addition to cast iron, 74.50; "F" nickel, 5 lb ingots in kegs for addition to cast iron, 75.50. Prices f.o.b. Port Colborne, Ont., including import duty. New York basis, add 1.01. Nickel oxide sinter at Buffalo, New York, or other established U. S. points of entry, contained nickel, 69.60.

Osmium: $70-100 per troy oz nom.

Palladium: $15-17 per troy oz.

Platinum: $57-60 per troy oz from refineries.

Radium: $16-21.50 per mg radium content, depending on quantity.

Rhodium: $118-125 per troy oz.

Ruthenium: $45-55 per troy oz.

Selenium: $7.00 per lb, commercial grade.

Silver: Open market 88.625 per troy oz.

Sodium: 17.00 c.l.; 19.00-19.50 l.c.l.

Tantalum: Rod, $60 per lb; sheet, $55 per lb.

Tellurium: $1.65-1.85 per lb.

Thallium: $7.50 per lb.

Tin: Straits, N. Y., spot and prompt, 92.75.

Titanium: Sponge, 99.3 + % grade A-1, ductile (0.3% Fe max.), 2.05; grade A-2 (0.5% Fe max.), $1.85 per lb.

Tungsten: Powder, 89.8%, carbon reduced, 1000-lb lots, $3.15 per lb nom., f.o.b. shipping point; less than 1000 lb, add 15.00; 99 + % hydrogen reduced, $3.30-3.80.

Zinc: Prime Western, 10.00; brass special, 10.25; intermediate, 10.50, East St. Louis, freight allowed over 0.50 per lb. New York basis, add 0.50. High grade, 11.00; special high grade, 11.25 deld. Diecasting alloy ingot No. 3, 12.25; No. 2, 12.75; No. 5, 12.50 deld.

Zirconium: Reactor grade sponge, 100 lb or less, $7 per lb; 100-500 lb, $6.50 per lb; over 500 lb, $6 per lb.

(Note: Chromium, manganese, and silicon metals are listed in ferroalloy section.)

SECONDARY METALS AND ALLOYS

Aluminum Ingot: Piston alloys, 23.50-25.25; No. 12 foundry alloy (No. 2 grade), 21.50-22.00; 5% silicon alloy, 0.60 Cu max., 24.75-25.00; 13 alloy 0.60 Cu max., 24.75-25.00; 195 alloy, 25.25-26.00; 108 alloy, 22.25-22.50. Steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 22.75; grade 2, 21.50; grade 3, 20.50; grade 4, 17.75.

Brass Ingot: Red brass, No. 115, 27.00; tin bronze, No. 225, 36.00; No. 245, 30.75; high-leaded tin bronze, No. 305, 31.25; No. 1 yellow, No. 405, 22.75; manganese bronze, No. 421, 24.50.

Magnesium Alloy Ingot: AZ63A, 37.50; AZ91B, 37.50; AZ91C, 41.25; AZ92A, 37.50.

NONFERROUS PRODUCTS

BERYLLIUM COPPER

(Base prices per lb, plus mill extras, 2000 to 5000 lb; nom. 1.9% Be alloy.) Strip, $1.845, f.o.b. Temple, Pa., or Reading, Pa.; rod, bar, wire, $1.825, f.o.b. Temple, Pa.

COPPER WIRE

Bare, soft, f.o.b. eastern mills, 20,000-lb lots, 31.855; l.c.l., 32.48. Weatherproof, 20,000-lb lots, 33.66, l.c.l., 34.41, before quantity discounts.

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh.) Sheets, full rolls, 140 sq ft or more, $16.50 per cwt; pipe, full coils, $16.50 per cwt; traps and bends, list prices plus 30%.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill.) Sheets and strip, $8.50-15.95; sheared mill plate, $6.00-9.50; wire, $6.50-11.00; forging billets, $4.10-4.35; hot-rolled and forged bars, $5.25-6.35.

ZINC

(Prices per lb, c.l., f.o.b. mill.) Sheets, 24.00; ribbon zinc in coils, 20.50; plates, 19.00.

ZIRCONIUM

Plate, $12.50-19.20; H.R. strip, $12.50-22.90; C.R. strip, $15.90-31.25; forged or H.R. bars, $11.00-17.40.

NICKEL, MONEL, INCONEL

	"A" Nickel	Monel	Inconel
Sheets, C.R.	126	106	128
Strips, C.R.	124	108	138
Plate, H.R.	120	105	121
Rod, Shapes, H.R.	107	89	109
Seamless Tubes	157	129	200

ALUMINUM

Sheets: 1100, 3003, and 5005 mill finish (30,000 lb base; freight allowed).

Thickness Range, Inches	Flat Sheet	Coiled Sheet
0.250-0.136	42.80-47.30	.....
0.136-0.096	43.20-48.30	.....
0.126-0.103	.....	39.20-39.80
0.096-0.077	43.80-50.00	39.30-40.00
0.077-0.068	44.30-52.20	.....
0.077-0.061	.....	39.50-40.70
0.068-0.061	44.30-52.20	.....
0.061-0.048	44.90-54.40	40.10-41.80
0.048-0.038	45.40-57.10	40.60-43.20
0.038-0.030	45.70-62.00	41.00-45.70
0.030-0.024	46.20-53.70	41.30-45.70
0.024-0.019	46.90-56.80	42.40-44.10
0.019-0.017	47.70-54.10	43.00-44.70
0.017-0.015	48.60-55.00	43.80-45.50
0.015-0.014	49.60	44.80-46.50
0.014-0.012	50.80	45.50
0.012-0.011	51.80	46.70
0.011-0.0095	53.30	48.10
0.0095-0.0085	54.60	49.60
0.0085-0.0075	56.20	50.80
0.0075-0.007	57.70	52.30
0.007-0.006	59.30	53.70

ALUMINUM (continued)

Plates and Circles: Thickness 0.250-3 in. 24-60 in. width or diam., 72-240 in. lengths.

Alloy	Plate Base	Circle Base
1100-F, 3003-F	42.40	47.20
5050-F	43.50	48.30
3004-F	44.50	50.20
5052-F	45.10	50.90
6061-T6	45.60	51.70
2024-T4	49.30	56.10
7075-T6*	57.60	64.70

*24-48 in. width or diam., 72-180 in. lengths.

Screw Machine Stock: 30,000 lb base.

Diam. (in.) or across flats*	Round 2011-T3	Round 2017-T4	Hexagonal 2011-T3	Hexagonal 2017-T4
0.125	76.90	73.90	....	....
0.250	62.00	60.20	89.10	76.60
0.375	61.20	60.00	73.50	68.50
0.500	61.20	60.00	73.50	68.50
0.625	61.20	60.00	69.80	64.20
0.750	59.70	58.40	63.60	60.40
0.875	59.70	58.40	63.60	60.40
1.000	59.70	58.40	63.60	60.40
1.125	57.30	56.10	61.50	58.30
1.250	57.30	56.10	61.50	58.30
1.375	57.30	56.10	61.50	58.30
1.500	57.30	56.10	61.50	58.30
1.625	55.00	53.60	....	56.20
1.750	55.00	53.60	60.30	56.20
1.875	55.00	53.60	....	56.20
2.000	55.00	53.60	60.30	56.20
2.125	53.50	52.10	....	....
2.250	53.50	52.10	....	56.20
2.375	53.50	52.10	....	....
2.500	53.50	52.10	....	56.20
2.625	....	50.40	....	....
2.750	51.90	50.40	....	56.20
2.875	....	50.40	....	....
3.000	51.90	50.40	....	56.20
3.125	....	50.40	....	....
3.250	....	50.40	....	....
3.375	....	50.40	....	....

*Selected sizes.

Forging Stock: Round, Class 1, random lengths, diam. 0.375-8 in., "F" temper; 2014, 42.20-55.00; 6061, 41.60-55.00; 7075, 61.60-75.00; 7070, 66.60-80.00.

Pipe: ASA schedule 40, alloy 6063-T6 standard lengths, plain ends, 90,000 lb base, dollars per 100 ft. Nominal pipe sizes: ⅜ in., 18.85; 1 in., 29.75; 1¼ in., 40.30; 1½ in., 48.15; 2 in., 58.30; 4 in., 160.20; 6 in., 287.55; 8 in., 432.70.

Extruded Solid Shapes:

Factor	Alloy 6063-T5	Alloy 6062-T6
9-11	42.70-44.20	51.30-55.50
12-14	42.70-44.20	52.00-56.50
15-17	42.70-44.20	53.20-58.20
18-20	43.20-44.70	55.20-60.80

MAGNESIUM

Sheet and Plate: AZ31B standard grade, 0.32 in., 103.10; .081 in., 77.90; .125 in., 70.40; .188 in., 69.00; .250-2.0 in., 67.90. AZ31B spec. grades, .032 in., 171.30; 081 in., 108.70; .125 in., 98.10; .188 in., 95.70; .250-2.00 in., 93.30. Tread plate, 60-192 in. lengths, 24-72 in. widths; .125 in., 74.90; .188 in., 71.70-72.70; .25-.75 in., 70.60-71.60. Tooling plate, .25-3.0 in., 73.00.

Extruded Solid Shapes:

Factor	Com. Grade (AZ31C)	Spec. Grade (AZ31B)
6-8	69.60-72.40	84.60-87.40
12-14	70.70-73.00	85.70-88.00
24-26	75.60-76.30	90.60-91.30
36-38	89.20-90.30	104.20-105.30

NONFERROUS SCRAP

DEALER'S BUYING PRICES

(Cents per pound, New York, in ton lots.)

Copper and Brass: No. 1 heavy copper and wire, 19.50-20.00; No. 2 heavy copper and wire, 17.50-18.00; light copper, 15.50-16.00; No. 1 com-

BRASS MILL PRICES

	MILL PRODUCTS a				SCRAP ALLOWANCES e (Based on copper at 26.50c)		
	Sheet, Strip, Plate	Rod	Wire	Seamless Tubes	Clean Heavy	Rod Ends	Clean Turnings
Copper	49.63b	46.86c	....	49.82	22.500	22.500	21.750
Yellow Brass	43.57	29.28d	44.11	46.48	17.000	16.750	15.250
Low Brass, 80%	46.03	45.97	46.57	48.84	19.000	18.750	18.250
Red Brass, 85%	46.89	46.83	47.43	49.70	19.750	19.500	19.000
Com. Bronze, 90%	48.30	48.24	48.84	50.86	20.625	20.375	19.875
Manganese Bronze	51.52	45.74	56.18	....	15.625	15.375	14.875
Muntz Metal	45.95	41.76	....	....	15.875	15.625	15.125
Naval Brass	47.83	42.14	54.89	50.99	15.625	15.375	14.875
Silicon Bronze	54.37	53.56	54.41	56.29	22.125	21.875	21.125
Nickel Silver, 10%	58.82	61.15	61.15	....	22.000	21.750	11.000
Phos. Bronze, A-5%	68.59	69.09	69.09	70.27	23.375	23.125	22.125

a. Cents per lb, f.o.b. mill; freight allowed on 500 lb or more. b. Hot-rolled. c. Cold-drawn. d. Free cutting. e. Prices in cents per lb for less than 20,000 lb, f.o.b. shipping point. On lots over 20,000 lb at one time, of any or all kinds of scrap, add 1 cent per lb.

position turnings, 14.50-15.00; new brass clippings, 13.25-13.75; light brass, 9.25-9.75; heavy yellow brass, 10.75-11.25; new brass rod ends 11.25-11.75; auto radiators, unsweated, 11.50-12.00; cocks and faucets, 12.50-13.00; brass pipe, 12.75-13.25.

Lead: Heavy, 6.50-6.75; battery plates, 2.00-2.25; linotype and stereotype, 8.50-9.00; electrotype, 7.50-8.00; mixed babbitt, 9.00-9.50.

Monel: Clippings, 32.00-34.00; old sheets, 26.00-28.00; turnings, 20.00-23.00; rods, 32.00-34.00.

Nickel: Sheets and clips, 50.00-52.00; rolled anodes, 50.00-52.00; turnings, 37.00-40.00; rod ends, 50.00-52.00.

Zinc: Old zinc, 3.00-3.25; new diecast scrap, 2.75-3.00; old diecast scrap, 1.50-1.75.

Aluminum: Old castings and sheets, 9.50-10.00; clean borings and turnings, 6.00-6.50; segregated low copper clips, 13.00-13.50; segregated high copper clips, 12.00-12.50; mixed low copper clips, 12.75-13.25; mixed high copper clips, 11.50-12.00.

(Cents per pound, Chicago)

Aluminum: Old castings and sheets, 10.50-11.00; clean borings and turnings, 9.50-10.00; segregated low copper clips, 16.50-17.00; segregated high copper clips, 15.50-16.00; mixed low copper clips, 15.50-16.00; mixed high copper clips, 15.00-15.50.

(Cents per pound, Cleveland)

Aluminum: Old castings and sheets, 9.25-10.00; clean borings and turnings, 8.50-9.00; segregated low copper clips, 13.50-14.00; segregated high copper clips, 12.00-12.50; mixed low copper clips, 12.00-12.50; mixed high copper clips, 11.00-11.50.

REFINERS' BUYING PRICES

(Cents per pound, carlots, delivered refinery)
Beryllium Copper: Heavy scrap, 0.020-in. and heavier, not less than 1.5% Be, 52.50; light scrap, 47.50; turnings and borings, 32.50.

Copper and Brass: No. 1 heavy copper and wire, 22.00; No. 2 heavy copper and wire, 21.25; light copper, 19.00; refinery brass (60% copper) per dry copper content, 20.00.

INGOTMAKERS' BUYING PRICES

Copper and Brass: No. 1 heavy copper and wire, 22.00; No. 2 heavy copper and wire, 21.25; light copper, 19.00; No. 1 composition borings, 18.75; No. 1 composition solids, 19.25; heavy yellow brass solids, 13.50; yellow brass turnings, 12.50; radiators, 15.25.

PLATING MATERIALS

(F.o.b. shipping point, freight allowed on quantities)

ANODES

Cadmium: Special or patented shapes, $1.55.

Copper: Flat-rolled, 43.03; oval, 14.50, 5000-10,000 lb; electrodeposited, 35.25, 2000-5000 lb lots; cast, 37.75, 5000-10,000 lb quantities.

Nickel: Depolarized, less than 100 lb, 114.25; 100-499 lb, 112.00; 500-4999 lb, 107.50; 5000-29,999 lb, 105.25; 30,000 lb, 103.00. Carbonized, deduct 3 cents a lb.

Tin: Bar or slab, less than 200 lb, 111.50; 200-499 lb, 110.00; 500-999 lb, 109.50; 1000 lb or more, 111.00.

Zinc: Balls, 16.00; flat tops, 16.00; flats, 19.25; ovals, 18.50, ton lots.

CHEMICALS

Cadmium Oxide: $1.55 per lb in 100-lb drums.

Chromic Acid (flake): 100-2000 lb, 31.00; 2000-10,000 lb, 30.50; 10,000-20,000 lb, 30.00; 20,000 lb or more, 29.50.

Copper Cyanide: 100-200 lb, 65.90; 300-900 lb, 63.90; 1000-19,900 lb, 61.90.

Copper Sulphate: 100-1900 lb, 14.05; 2000-5900 lb, 12.05; 6000-11,900 lb, 11.80; 12,000-22,900 lb, 11.55; 23,000 lb or more, 11.05.

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& ALL TRACK EQUIPMENT
Nation's Largest Warehouse Stocks
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CHICAGO 4 • HOUSTON 2 • LOS ANGELES 5

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National Trade Association seeks competent man experienced in cast metals and general engineering for responsible position as Technical Director. Will handle development and research projects, coordination of broad technical program and relations with engineers and Technical Societies. Progressive organization, excellent future. Some travel. Write giving personal background and qualifications. Replies confidential.

MALLEABLE FOUNDERS' SOCIETY
1800 Union Commerce Building
Cleveland 14, Ohio

INDUSTRIAL ENGINEERS

Career opportunities are available for qualified men with at least one or two years experience in Standard Cost, Time Study or Incentive Development and/or Methods Analysis. Prefer steel operations background. Also openings available for recent college graduates with technical degrees. Prompt consideration given all replies. Submit resume to:

DIRECTOR OF EMPLOYEE SERVICES
GREAT LAKES STEEL CORPORATION
Ecorse, Detroit 29, Michigan

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Industrial Engineer

Must be thoroughly experienced in fabrication, erection and material control—fearless trouble shooter.

Send job and education resume to Box 691, STEEL, Penton Bldg., Cleveland 13, Ohio.

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METAL PRODUCTS TO MANUFACTURE

Large, well equipped, well capitalized, sheet metal, light plate and structural shop is seeking assemblies or subassemblies to manufacture.

Plant has 170,000 sq. ft. of floor space and is centrally located in highly industrialized area. Equipment for square and rotary shearing, stamping (presses up to 200 tons), rolling, brake-forming, spot and seam-welding, manual arc, heliarc, sigma and unimelt welding, angle tube and bar forming, spray or dip painting, adequate packing and rail facilities available.

Practically no physical limitations as to length, height or weight of product. **WRITE BOX NO. 690, STEEL, PENTON BLDG., CLEVELAND 13, OHIO.**

WANT TO BUY
Steel By-Products Discs

2" to 2¼"	Diameter	.060 to .125
4½"	Diameter	.060 to .125
6½" to 10"	Diameter	.060 to .125
11" to 12½"	Diameter	.085 to .095

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1—DC Steam Driven Generator, 150 KW, 240 Volt, Fleming Harrisburg Steam Engine, 200 HP.

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National Standard Co.
Clifton, New Jersey

MODERN OVERHEAD CRANES

CAN BE INSPECTED IN OPERATION

Capacity	Name	Span	Lift
150 Tons (2-75 T. Trolleys)	**Shepard Niles**	**100′**	**39′**
20 Tons	Shepard Niles	98′ 10″	27′
2-20 Tons (2-10 T. Trolleys)	N.B.P.	71′ 10″	25′ 6″
15 Tons	N.B.P.	47′	19′
10 Tons	Shaw	85′	22′

All Cranes 230 Volts DC—All Late Model Cranes

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1776 Clinton Ave. No.,	Box 181	Rochester 10, N. Y.
PHONE	**WIRE**	**WRITE**
Mr. Shaw	Rochester, N. Y.	COngress 6-3030

(Concluded from Page 137)

440 tons, St. Agnes School, College Point, New York, through Garriston Contracting Co., general contractor, to Schacht Steel Construction Inc., New York.

380 tons, state bridge work, Morris County, New Jersey, to Schacht Steel Construction Inc., New York.

365 tons, state bridge over Stillwater Ave., Bangor, Maine, to Bancroft & Martin Rolling Mills Co., South Portland, Maine; H. B. Fleming Inc., South Portland, general contractor.

200 tons, two dormitories, Tufts University, Medford, Mass., to A. O. Wilson Structural Co., Cambridge, Mass.; George B. H. Macomber Co., Boston, general contractor; 500 tons, reinforcing bars, to Northern Steel Inc., Medford, Mass.

190 tons, including reinforcing bars, Densmore Road Bridge, Sidney, Maine, to Bancroft & Martin Rolling Mills Co., South Portland, Maine; Cianchette Bros. Inc., Pittsfield, Maine, general contractor.

185 tons, building, Campbell Soup Co., Moorestown, N. J., to Frank M. Weaver Co., Lansdale, Pa.

165 tons, junior high school, Ypsilanti, Mich., to Copco Steel & Engineering Co., Saginaw, Mich.; Spence Bros. Corp., Saginaw, general contractor; reinforcing bars to Truscon Steel Div., Republic Steel Corp., Detroit.

130 tons, including reinforcing bars, 2-span composite WF beam bridge, Menton, Vt., to Vermont Structural Steel Co., Burlington, Vt.; Lambert Construction Co. Inc., White River Junction, Vt., general contractor.

120 tons, state highway bridge, Mansfield, Conn., to City Iron Works, Wethersfield, Conn. (structurals), and Plantations Steel Co., Providence, R. I. (reinforcing); Simpson & Whitehouse Construction Co., Mansfield, general contractor.

102 tons, state bridge, New Castle, Del., to Budd Metal Co., Philadelphia.

80 tons, boilerhouse, University of Washington, Seattle, to the Pacifc Car & Foundry Co., Seattle.

STRUCTURAL STEEL PENDING

1855 tons, state bridge work, Clinton County, New York, Northern Construction Corp., Lawrence, Mass., low on the general contract.

806 tons, Montana State 276-ft interchange and 360-ft overpass, Shelby County; F.&S. Contracting Co., Butte, Mont., is low at $1,793,154.

800 tons, Montana State bridge, Superior County; bids in Sept. 24.

750 tons, Ft. Peck, Mont., second powerplant; bids in.

650 tons, state bridge work, Broome County, New York, D. Cerrentami & Sons, Binghamton, N. Y., low on the general contract.

565 tons, student center, Manhattan College, New York, Stewart Mulle, Croton-on-Hudson, New York, low on the general contract.

470 tons, plant and office building, Edmund Schoettle Co., Upper Gwyedd, Pa., bids asked.

450 tons, Ice Harbor power project, Washington State; bids in.

360 tons, state bridge work, Montgomery County, New York, Arthur A. Johnson Corp. and Peter Kiewit, New York, low on the general contract through a joint bid.

330 tons, also 115 tons of reinforcing, Washington State highway bridge, Adams County; bids to Olympia, Wash., Oct. 7.

250 tons, Ice Harbor project shops, Washington State; bids in.

200 tons, Penn-Delco Junior-Senior High School, Greenridge, Pa., bids asked.

174 tons, also 50 tons of reinforcing, Washington State highway bridge, Skagit County; bids to Olympia, Wash., Oct. 7.

150 tons, state bridge work, Putnam County, New York, A. E. Oteabiano Inc., Croton-on-Hudson, New York, low on the general contract.

Unstated, Oregon State 654-ft viaduct, Multnomah County; bids to Salem, Oreg., Sept. 30.

REINFORCING BARS . . .

REINFORCING BARS PLACED

650 tons, high school, Wilmington, Del., to Taylor-Davis Inc., Philadelphia.

175 tons, Washington State highway project, Pierce County, to J. D. English Steel Co., Tacoma, Wash.; Woodworth & Co., Tacoma, general contractor.

119 tons, building, Mel Richmond Studios, Philadelphia, to American Steel Engineering Co., Philadelphia.

100 tons, Washington State road project, Skagit County, to Bethlehem Pacific Coast Steel Corp., Seattle; C. B. Croy, Bellingham, Wash., general contractor.

100 tons, Idaho State span, Winchester, to Joseph T. Ryerson & Son Inc., Spokane, Wash.

REINFORCING BARS PENDING

8000 tons, Ice Harbor powerhouse substructure; Guy F. Atkinson Co., South San Francisco, Calif., low at $7,360,599 to the U. S. Engineer, Walla Walla, Wash.

2100 tons, Ice Harbor power project, Washington State; bids in.

380 tons, building, Jefferson Medical School, Philadelphia, John McShane, Philadelphia, general contractor.

357 tons, Washington State College, Bellingham, Wash.; bids in.

310 tons, Philadelphia, Women's Medical College, Joseph Farrell, Philadelphia, general contractor.

250 tons, warehouse and maintenance building, Pennhurst, Pa., H. E. Irwin, Philadelphia, general contractor.

126 tons, Montana State, nine concrete highway spans; C. B. Lauch Construction Co., Great Fall, Mont., low at $336,280.

125 tons, Washington State undercrossing, King County; bids to Olympia, Wash., Oct. 7.

107 tons, student union building, Bellingham, Wash.; bids in.

75 tons, Washington State arch span, Clallam County; bids to Olympia, Wash., Oct. 7.

25 tons, also 1400 ft of piling, Sitka highway bridge; bids to the Bureau of Public Roads, Juneau, Alaska, Oct. 7.

Unstated, Cascade County Hospital, Great Falls, Mont.; Palmer Construction Co., Great Falls, low at $1,265,687.

Unstated, Oregon State highway bridges, Clackamas, Clatsop, Josephine, Linn, Malheur, and Washington counties; bids to Salem, Oreg., Sept. 30.

PLATES . . .

PLATES PLACED

1800 tons, sheet steel piling, dike protection, air base, Galena, Alaska, to the Bethlehem Pacific Coast Steel Corp., Seattle.

135 tons, steel tank, District No. 100, Seattle, to Pittsburgh-Des Moines Steel Co., Seattle.

70 tons, water tank, Milton, Wash., to Chicago Bridge & Iron Co., Seattle, low at $43,155.

PLATES PENDING

8000 tons, including shapes, penstocks, etc., Ft. Peck, Mont., power project; bids in to the U. S. Engineer.

8000 tons, penstocks, surge tanks, etc., second powerplant, Ft. Peck, Mont.; Chicago Bridge & Iron Co., Salt Lake City, is low at $4,624,100.

Unstated, 1.5-million gal. elevated steel water tank; bids to Portland, Oreg., Sept. 29.

PIPE . . .

CAST IRON PIPE PLACED

200 tons, 10 in. for Monroe, Wash., to Pacific States Cast Iron Pipe Co., Seattle.

197 tons, 12 in., Snohomish, Wash., to Pacific States Cast Iron Pipe Co., Seattle.

100 tons, 12 in., Alderwood Manor, Wash., to U. S. Pipe & Foundry Co., Seattle.

RAILS, CARS . . .

RAILROAD CARS PLACED

Baltimore & Ohio, 1000 seventy-ton gondolas, to be built at its Du Bois, Pa. shops. Major components, involving 18,000 tons of steel, awarded to the Johnstown, Pa., plant of Bethlehem Steel Co.; car ends and accessories to specialized suppliers.

Canadian National Railways, 125 double-deck automobile cars, to the Canadian Car & Foundry Co., Montreal, Canada.

Steel Consumption by Markets—July, 1958

(All grades; net tons)

Markets	—July Shipments— 1958	1957	—First Seven Months— 1958	1957
Converting & processing	186,866	249,041	1,572,607	2,221,833
Forgings (other than auto)	35,524	58,245	403,031	700,856
Bolts, nuts, rivets, etc.	47,815	67,807	407,856	686,129
Warehouses & Distributors:				
Oil and gas industry	67,818	197,361	531,766	1,552,466
All other	764,397	900,013	5,398,724	7,903,090
Total warehouse	832,215	1,097,374	5,930,490	9,455,556
Construction, including Maintenance:				
Rail transportation	3,135	5,723	28,070	38,668
Oil and gas	189,410	300,709	1,294,873	2,096,912
All other	464,843	731,492	3,811,775	5,430,013
Total construction	657,388	1,037,924	5,134,718	7,565,593
Contractors' Products	259,143	233,602	1,940,940	2,160,325
Automotive:				
Cars, trucks, parts	617,089	920,099	4,598,379	7,995,464
Forgings	12,995	18,801	130,963	194,041
Total automotive	630,084	938,900	4,729,342	8,189,505
Rail Transportation:				
Rails, track, equipment	24,299	118,748	393,011	1,086,348
Cars and locomotives	24,238	215,173	509,627	1,733,744
Street cars, etc.	1,337	3,954	12,885	22,217
Total railroad	49,874	337,875	915,523	2,842,309
Shipbuilding	50,592	108,455	490,699	698,782
Aircraft	4,104	6,528	34,125	72,302
Oil & gas drilling	14,069	48,155	169,622	479,427
Mining, quarrying, etc.	7,943	21,298	105,081	214,596
Agricultural:				
Machinery	57,821	50,716	512,021	531,288
All other	31,235	14,001	160,057	118,182
Total agricultural	89,056	64,717	672,078	649,470
Machinery, equipment, tools	189,558	315,846	1,718,647	2,958,694
Electrical machinery, etc.	94,316	145,856	977,058	1,310,345
Appliances, etc.	94,516	89,888	787,920	917,842
Other equipment	100,311	115,772	935,695	1,138,205
Containers:				
Cans and closures	454,008	375,397	3,181,786	3,286,964
Barrels, drums, pails	49,113	63,460	440,000	534,853
All other containers	30,130	36,277	263,214	381,704
Total containers	533,251	475,134	3,885,000	4,203,521
Ordnance, other military	19,107	24,768	147,115	251,583
Nonreported shipments	52,789	58,765	376,029	528,712
Total domestic shipments	3,948,521	5,495,950	31,333,576	47,245,585
Exports	133,223	381,183	1,439,344	2,917,276
Total shipments	4,081,744	5,877,133	32,772,920	50,162,861

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RED CIRCLE
Rolls
ALLOY-CHILLED
Hyde Park
Rolling Mill Equipment
For more than 50 years Hyde Park Steel Mill equipment has been helping American industry lead the world — equipment such as—
• Bar Mills
• Merchant Mills
• Sheet and Strip Mills
• Pinion Stands
• Roller Tables
• Reduction Drives
• Stretcher Levellers
• Guillotine Shears
• Sheet Mill Shears
• Roll Lathes
• Special Machinery
• Machine Work
For finer finish, long life and greater tonnage, specify Red Circle Rolls.
Hyde Park
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Hyde Park, Westmoreland Co., Pa.
ROLLS
ROLLING MILL MACHINERY
GRAY IRON CASTINGS

Tuffy® Tips On

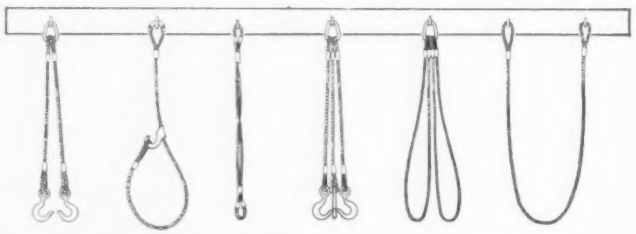
SAFE USE OF SLINGS AND HOIST LINES

Half of All Workmen's Compensation Cases in Ontario Caused by Materials Handling Accidents

Officials of the Workmen's Compensation Board at Toronto recently reported that 50% of compensation cases in 1956 (excluding accidents in which workmen were struck by something) were caused in materials handling work. Back injuries totaled 16.7% of compensated cases. Medical aid and compensation for back injuries added up to $4,520,000.

That's a high price to pay, in human disability and suffering as well as in dollars, for avoidable accidents. It can be greatly reduced if safe methods of materials handling are more widely adopted and more diligently applied.

Here are some of the things you can do to reduce hazards of faulty equipment and operation:



Safety Begins with "Good Housekeeping"

Too often, slings are dumped in a corner of a storeroom after use. When they're needed again, it's difficult to untangle them and the wrong sling is chosen because it is easiest to get to. Shown here is a rack which makes orderly storage easy. Such tidiness makes for greater efficiency and safety all around.

1. **Keep slings,** ropes, chains, and cables in orderly storage when they're not being used. Such equipment can be damaged between lifts if it is left in haphazard piles.
2. **Don't allow** hitching equipment to remain loose on crane hooks, hoists and loads when not in use.
3. **Check hitching** equipment before using. Inspect it again before return to storage.
4. **Shake out** kinks and twists **to prevent kinked slings** before loading slings. Never use a kinked sling. Remember it is next to impossible to kink a Tuffy Sling in normal use; and when kinks do occur, they can be smoothed out with no serious damage.
5. **Make sure** crane and hoist controls are in best working condition. Test all equipment frequently.

FREE! Tuffy Sling Handbook

Gives complete data on Tuffy Slings — types, dimensions, weights and rate loads. Plus a complete rigger's manual and engineers notebook on wire rope constructions and specifications. Write for your copy now.

You're On the Safe Side With Tuffy® Slings

Maximum safety is one of the many benefits you get in Tuffy Slings. Here are some of the reasons why:

Pressed-On Streamlined Ferrules

Tuffy's pressed-on ferrule gives the tucked eye splice 100% of fabric strength. Applied under great pressure, the steel ferrule literally flows into spaces between wires and strands, developing friction force equal to full fabric strength. Streamlining eliminates snags and projections that might injure hands.

Tuffy's Exclusive Fabric

Only Tuffy gives you the exclusive, patented, machine-braided fabric that combines extra strength and flexibility never before built into any sling. It makes knotting and kinking next to impossible, and if kinks do occur they are easily smoothed out.

Your Tuffy Distributor Will Help You Save Money

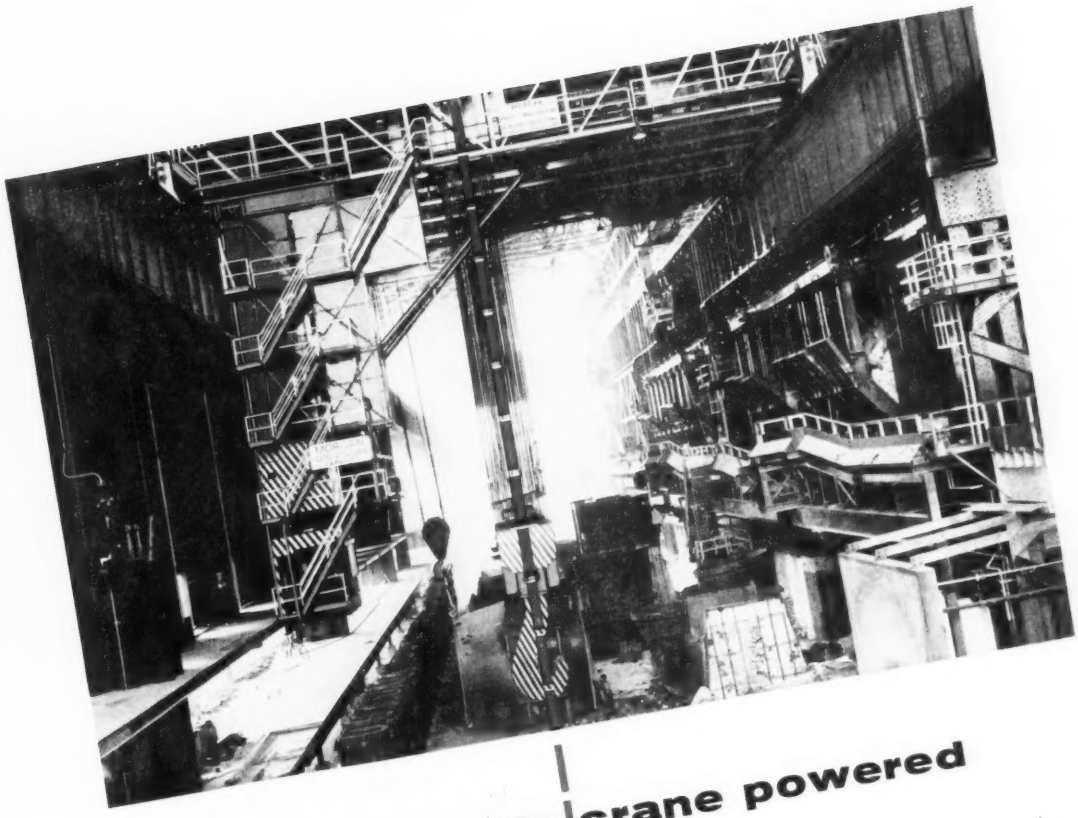
He's stocked to give you fast delivery on Tuffy Slings, Hoist Line and other Union Wire Rope. The longer life and greater safety of Tuffy can reduce your operating costs. Get in touch with your Tuffy distributor now.

union Wire Rope corporation

SUBSIDIARY ARMCO STEEL CORPORATION

Specialists in high carbon wire, wire rope, braided wire fabric, stress relieved wire and strand

2160 Manchester Ave. **Kansas City 26, Missouri**



Morgan 500-ton ladle crane powered by Cleveland drives

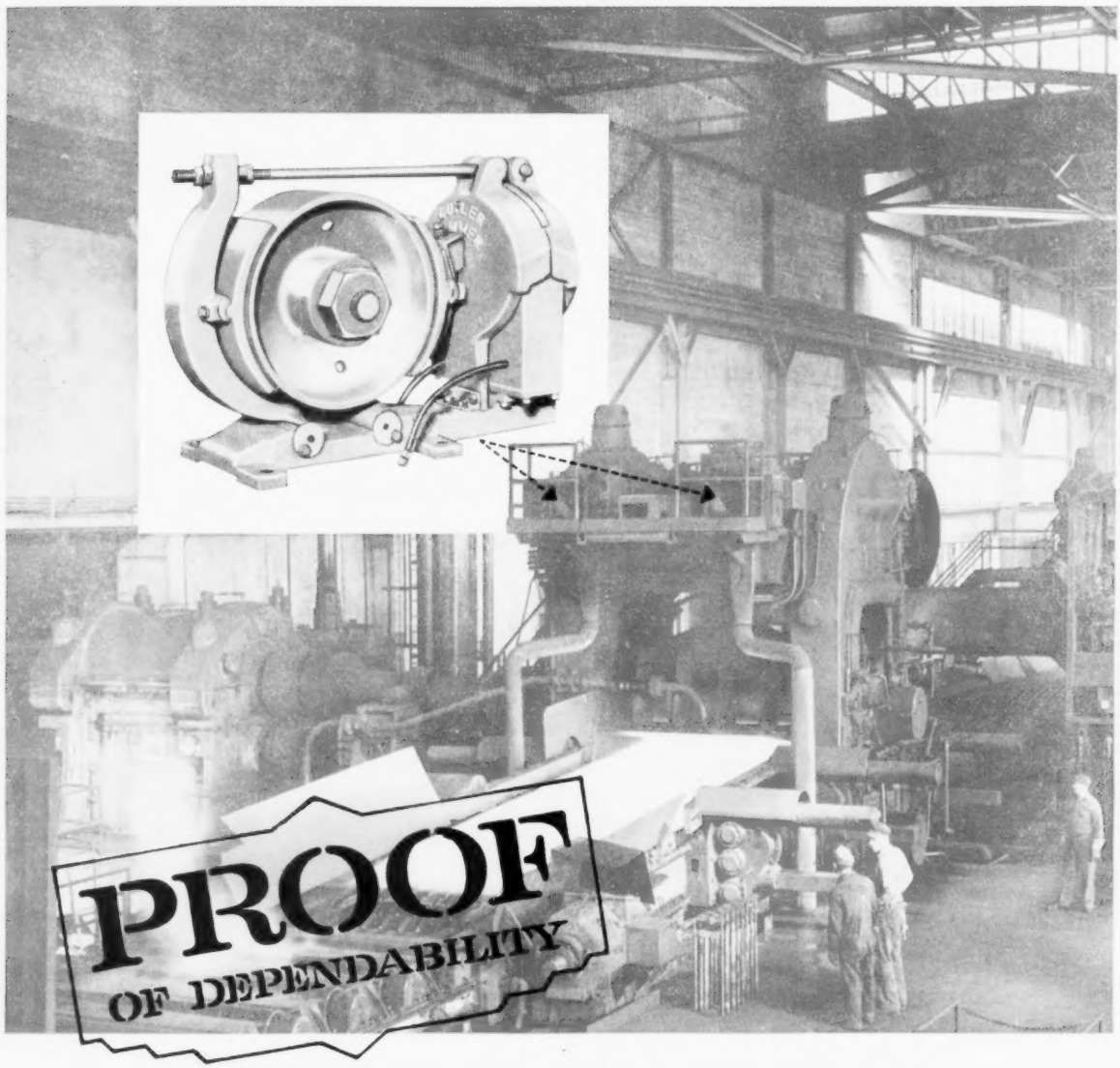
In an Eastern steel producer's open-hearth department, this giant 500-ton hot metal ladle crane substantially speeds up furnace-to-mold time on their ingot casting flow.

It features two custom-built Cleveland worm and gear sets transmitting 360 horsepower each for driving the hoist gear train on the 500-ton large trolley—providing uniform hoisting speed and power at all times.

Clevelands are designed and built to meet any requirement, wherever a powerful right-angle drive is preferred. Get the latest facts on the "Cleveland Story". Write us for your free copy of Bulletin 145. The Cleveland Worm & Gear Company, 3270 East 80th Street, Cleveland 4, Ohio.

CLEVELAND
Worm Gear
Speed Reducers

Affiliate: The Farval Corporation, Centralized Systems of Lubrication. In Canada: Peacock Brothers Limited.



Cutler-Hammer 505 Mill Brakes end costly production interruptions at a large Midwest Steel Plant

Here's dramatic evidence Cutler-Hammer 505 Mill Brakes are designed right to work better and last longer. A large Midwest Steel Plant had been using another make of Mill Brakes on their mill screwdowns and found it necessary to interrupt production frequently to repair these brakes. The brakes required adjustment weekly . . . followed by monthly overhauls.

Then the brakes on one mill were replaced with 23" Cutler-Hammer 505 Mill Brakes, and the results were most amazing. The Cutler-Hammer 505 Mill Brakes worked continuously . . . perfectly with only minor adjustments for lining wear . . . and even these adjustments could be accomplished without halting the mill. As a result, the Shop Electrical Superintendent turned in a *Cost Reduction Report* prompting the plant's standardization on Cutler-Hammer 505 Mill Brakes.

This is positive proof of dependability . . . proof that Cutler-Hammer 505 Mill Brakes work better and last longer even under the most severe operating conditions. Why take chances with costly production interruptions? Specify Cutler-Hammer 505 Mill Brakes and be sure. For complete information write today for Bul. 505-T213. Cutler-Hammer Inc., Milwaukee 1, Wisconsin.

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